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NOVEMBER 7
1935

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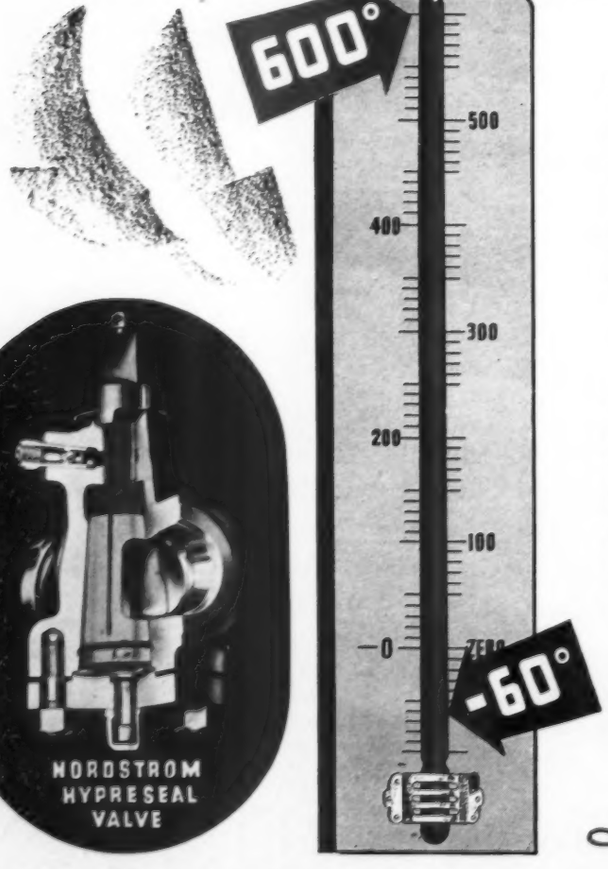

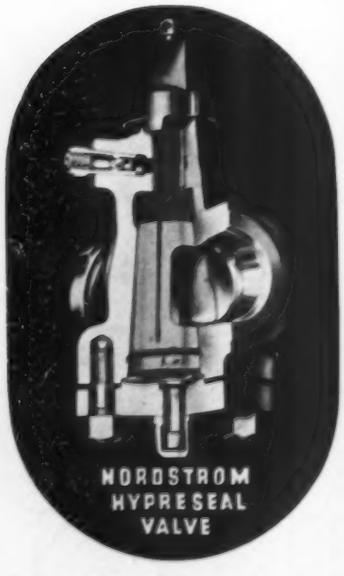

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Rates: Domestic, 1 year, $6.00; 6 months, $3.00. Canadian and foreign, 1 year, $7.00; 6 months, $3.50. All subscriptions are payable in advance

NOVEMBER 7, 1935
VOL. 34, NO. 25

Extra copies of special issues are reserved for subscribers' needs and may be purchased by subscribers at the price of 50 cents per copy

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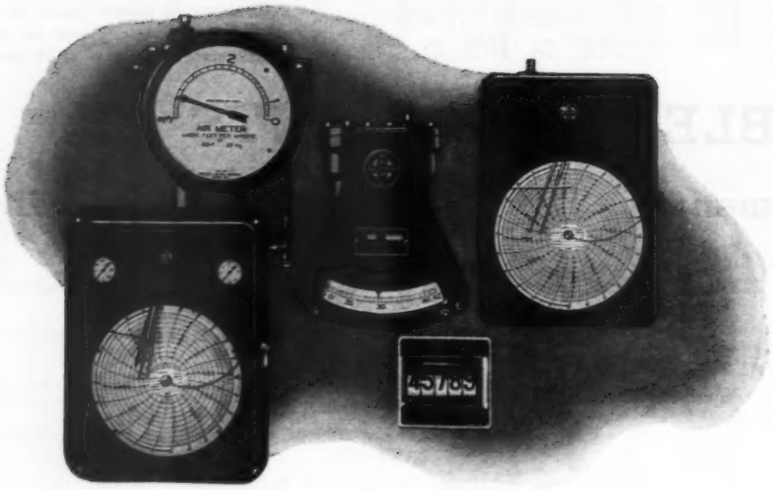

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Outlook Good If Existing Status Holds

By ANDREW M. ROWLEY

CRUDE OIL PRICE schedules of all purchasing companies in California again are on the same level indicating progress is being made in efforts to stabilize conditions on the Pacific Coast. The new prices, announced by the Standard and met by all other companies, including the Union, represent increases ranging from 6 cents for lower gravities to 30 cents for higher gravities, as compared to the schedule made effective August 29. Prices announced by the Union as effective October 26 were higher than the present schedule.

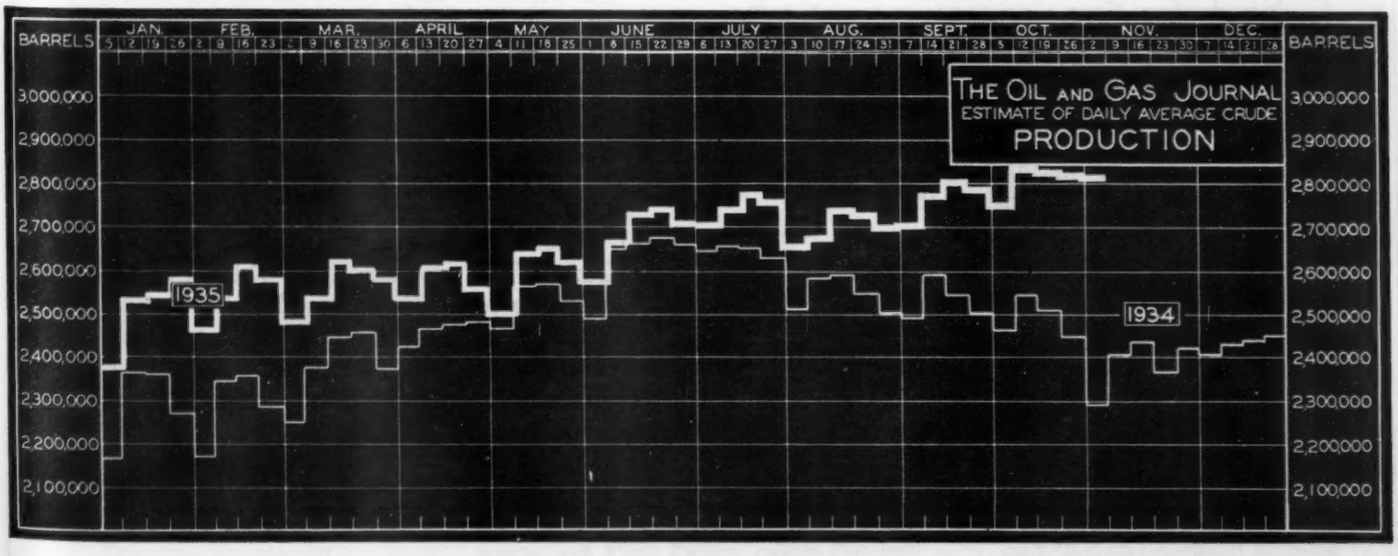
California production last week registered another increase but the belief is expressed the better prices now prevailing will aid in efforts to balance supply and demand. Increases in gasoline prices were announced at the time the new crude oil price schedules went into effect. The feeling prevalent in the industry is conditions are good; the outlook is good; and further improvement will be experienced next year if the industry can be satisfied through the winter with the present price relationship. In other words, premature efforts to obtain better prices might affect adversely stabilized conditions which now exist throughout the greater part of the business.

Production 2,819,164
Decrease 6,132

Reductions in crude oil production and runs to stills naturally are in order due to lessened consumption. Field operations continue at a high level. Flow of the important deep sand discovery of the Carter Oil Company and others in the Fox Pool in Oklahoma has been killed to permit removal of drill pipe and the setting of casing. Big wells continue to characterize operations in the Oxford Pool in Kansas. One new well in Rodessa made 85 barrels an hour. A wildcat in Midland County, Michigan, producing from the Berea sand, is attracting attention. A 17,107-barrel well was completed in the Hobbs Pool, New Mexico, by Samedan Oil Co.

Daily Average Production for Week Ending Nov. 2, Previous Week and a Year Ago

	Nov. 2	Oct. 26	Nov. 3, 1934
Oklahoma City	134,425	136,150	108,950
Seminole-St. Louis	93,650	95,410	69,025
Remainder of State	264,325	268,315	222,475
Total Oklahoma	492,400	499,875	400,450
East Texas	475,270	458,488	414,770
West Texas	155,197	155,448	140,774
North Central Texas	84,510	84,597	84,510
Texas Panhandle	55,797	56,047	62,023
East Central Texas	44,449	45,952	42,973
Gulf Coast—Texas	193,100	193,747	163,424
Southwest Texas	61,550	60,897	60,053
Total State of Texas	1,051,873	1,055,176	968,527
North Louisiana	33,020	32,085	24,135
Gulf Coast—Louisiana	128,097	124,850	81,473
Total Louisiana	161,117	156,935	105,608
Santa Fe Springs	55,500	55,100	35,000
Long Beach	76,900	77,350	51,250
Mountain View	36,800	38,000	9,750
Kettleman Hills	110,000	101,750	61,150
Remainder of State	382,300	385,800	287,850
Total California	661,500	658,000	445,000
Kansas	149,825	150,950	119,975
Arkansas	29,855	30,130	30,235
Eastern Fields	105,000	104,750	104,000
Michigan	55,654	54,512	26,736
Rocky Mountain area	111,940	114,968	94,190
Total United States	2,819,164	2,825,296	2,294,721



THE BULLETIN BOARD

New Officers, 46 directors and an executive committee will be selected at the annual meeting of the American Petroleum Institute in Los Angeles next week. Indications point to the re-election of Axtell J. Byles as president of the organization.

Self-Government in the oil industry may be assured, it is suggested in a statement having the President's approval, if the various oil associations get together and appoint committees to work out an agreement or code of fair practices which may be submitted to the Federal Trade Commission for its approval.

An Oil Embargo against Italy will be sought by major powers who are members of the League of Nations. Cooperation of the United States will be asked, it is said, although there is doubt the neutrality act can be interpreted to include oil.

Charles F. Roeser, independent producer of Fort Worth, was elected president of the Independent Petroleum Association of America to succeed Wirt Franklin who has headed the organization since its formation but who insisted on retiring from the office because of ill health.

Introducing New Car models two months earlier this year through the New York Automobile Show is an experiment, and if large volume sales develop, gasoline consumption will be improved this winter and the movement will tend to level off seasonal variations in demand.

Deep Production discovered by the Carter Oil Company and others in the old Fox Pool in Oklahoma, while stimulating great interest in the entire area south of the Arbuckles Mountains, will not cause any extensive drilling campaign until the exact importance of the well is determined.

President Roosevelt approved a statement read at the annual convention of the Independent Petroleum Association of America to the effect if the efforts being made by constructive elements in the oil industry to hold the ground gained by the NRA are successful the Federal government has no desire to make a public utility of this business.

Construction of a 40,000-gallon well pressure natural gasoline plant will be started immediately in Lea County, New Mexico and as the Monument Field is developed, connections are expected to be made to serve between 150 and 200 wells. This capacity will make the plant the largest of its kind in the state.

California Crude Prices paid by the various purchasing companies are now uniform following action by the Standard Oil Company of California in increasing its posted quotations from 6 to 30 cents above its schedule of August 29 and the meeting of these prices by other companies, including the Union Oil Co. which previously had announced higher schedules.

Gasoline Markets in almost all areas are maintaining unusual sturdiness. Tank car prices in the Oklahoma (Group 3) territory are preserving the same level that prevailed throughout the season of peak consumption, and observers say they may finish the year without the customary seasonal recession.

No. 1 Lillis-Welsh, in the Kettleman North Dome Field of California, which in 1933 held the record of being the deepest rotary hole in the world and then had to be abandoned at 10,944 feet because of junk in the hole, is again below the 10,000-foot level, a new hole being drilled from 7,000 feet, with prospects of getting a production test before Christmas.

Officers and Forty-six Directors to Be Selected at the Meeting of A. P. I.

Representatives of every branch of the petroleum industry are moving this week to Los Angeles, where the sixteenth annual meeting of the American Petroleum Institute opens in the Biltmore Hotel next Monday morning.

The program for the meeting this year includes two general sessions with six principal speakers, the group sessions of the three divisions of the Institute, Production, Refining and Marketing; meetings of 55 committees working on different subjects; daily sessions of the board of directors; a meeting of the executive committee; and the election of nine officers, an executive committee and 46 members of the board of directors. Particular interest centers in the addresses at the general sessions as the speakers will discuss matters of interest to the whole industry at this time.

Will Elect President

The board of directors at this meeting will elect a president of the Institute as the term of Mr. Byles expires. All indications at this time point to the re-election of Mr. Byles. Other Institute officers whose terms expire are: Vice president at large, K. R. Kingsbury, Standard Oil Co. of California, San Francisco; vice president for production, George A. Hill, Jr., Houston Oil Co. of Texas, Houston; vice president for refining, W. G. Skelly, Skelly Oil Co., Tulsa; vice president for marketing, C. E. Arnott, Socony-Vacuum Oil Co., New York; executive vice president, W. R. Boyd, Jr., New York; treasurer, D. J. Moran, Continental Oil Co., New York; secretary and assistant treasurer, Lacey Walker, New York; and assistant secretary, J. S. Cooke, New York.

Members of the executive committee whose terms expire are Messrs. Skelly, Arnott, Hill, Moran and Kingsbury, F. A. Leovy, Gulf Production Co.; J. Howard Pew, Sun Oil Co.; E. G. Seubert, Standard Oil Co. (Indiana); H. F. Sinclair, Consolidated Oil Corp.; W. C. Teagle, Standard Oil Co. (New Jersey); and J. C. Van Eck, Shell Union Oil Corp.

AXTELL J. BYLES
President, American Petroleum Institute

The officers, executive committee, and 12 members of the board are to be elected by the directors, while 34 other members of the board are to be nominated by the board of councillors and elected by the members at the general session Tuesday, November 12.

Election of Directors

The 12 members of the board of directors to be elected by the board itself are to succeed the following members in the at-large group whose terms of office expire: Mr. Arnott, J. Frank Drake, Gulf Oil Corp., Pittsburgh; W. S. Fitzpatrick, Consolidated Oil Corp., New York; W. M. Irish, Atlantic Refining Co., Philadelphia; E. T. Moore, Simms Petroleum Co., Dallas; T. A. O'Donnell, Los Angeles; W. S. S. Rodgers, Texas Co., New York; E. L. Smith, E. L. Smith Oil Co., Mexia, Tex.; Paul G. Blazer, Ashland Refining Co., Ashland, Ky.; B. L. Majewski, Deep Rock Oil Corp., Chicago; A. Jacobsen, Amerada Petroleum Corp., New York; and T. P. Thompson, Jr., Penn Grade Crude Oil Association, Bradford, Pa.

Members of the Institute will elect from nominees selected by the board of councillors directors to succeed the following whose terms expire:

Production Group—Pacific Coast: George Legh-Jones, Shell Oil Co., San Francisco, and W. C. McDuffie, Pacific Western Oil Co., Los Angeles. Rocky Mountain: B. B. Brooks, Consolidated Royalty Oil Co., Casper, Wyo. Central United States: H. V. Foster, Foster Petroleum Corp., Bartlesville, Okla.; Charles F. Roeser, Roeser & Pendleton, Fort Worth; J. Edgar Pew, Sun Oil Co., Philadelphia; and Frank Phillips, Phillips Petroleum Co., Bartlesville, Okla. Eastern United States: O. D. Donnell, Ohio Oil Co., Findlay, Ohio.

Manufacturing Group—Pacific Coast: R. D. Matthews, Union Oil Co., Los Angeles. Rocky Mountain: T. A. Dines, Salt Creek Producers Association, Denver. Central United States: P. M. Miskell, Empire Refineries, Inc., Tulsa. Eastern United States; Charles L. Suhr, Pennzoil Co.

Distribution Group—Rocky Mountain: W. H. Ferguson, Continental Oil Co., Denver. Central United States: E. G. Seubert, Standard Oil Co. (Indiana), Chicago. Eastern United States: W. T. Holliday, Standard Oil Co. of Ohio, Cleveland, Ohio.

Transportation Group—Pipe Lines: D. S. Bushnell, Northern Group of Pipe Lines, New York. Tank Cars: Lauren J. Drake, Union Tank Car Co., Chicago. Supply: J. A. Crawford, Republic Supply Co., Los Angeles.

Natural Gas Group—T. B. Gregory, Manufacturers Light & Heat Co., Pittsburgh.

Natural Gasoline (Casinghead) Group—D. E. Buchanan, Hanlon-Buchanan, Inc., Tulsa.

Foreign Trade Group—Far East: H. L. Pratt, Standard Oil Co. of New York, New York. Mexico and South America; Richard Airey, Asiatic Petroleum Co., New York.

At-Large Group—Frank Coates, Henry L. Doherty & Co., New York; W. N. Davis, Phillips Petroleum Co., Bartlesville; R. C. Holmes, New York; F. A. Leovy, Gulf Production Co., Pittsburgh; J. F. Lucey, Lucey Petroleum Co., Dallas, Tex.; E. W. Marland, Ponca City, Okla.; H. C. Weiss, Humble Oil & Refining Co., Houston; E. B. Reeser, Barnsdall Oil Corp., Tulsa; H. F. Sinclair, Consolidated Oil Corp., New York; J. W. VanDyke, Atlantic Refining Co., Philadelphia; J. D. Collett, O'Keefe & Collett, Fort Worth, Tex., and H. T. Klein, The Texas Co., New York.

W. R. BOYD, JR.
Executive vice president

LACEY WALKER
Secretary and assistant treasurer

PROGRAM FOR SIXTEENTH ANNUAL MEETING OF THE AMERICAN PETROLEUM INSTITUTE, LOS ANGELES, CALIF.

Tuesday, November 12

10:30 A.M.

MEETING OF BOARD OF COUNCILLORS: (Ball Room)

2:30 P.M.

GENERAL SESSION: (Ball Room)

Presentation of Accident-Prevention Certificate Awards.
Report of Board of Councillors and Election of Directors.
Address: Axtell J. Byles, American Petroleum Institute.
Address: Baird H. Markham, American Petroleum Industries Committee.
Address: C. E. Arnott, Socony-Vacuum Oil Company, Inc.

Group Session
DIVISION OF PRODUCTION

8:00 P.M.

METALLURGY AND CORROSION: (Ball Room)

(Sponsored by the Topical Committee on Metallurgy and Corrosion of Oil-Field Equipment, of the Central Committee on Drilling and Production Practice.)
Presiding: B. B. Westcott, Gulf Research and Development Corp.
These papers are for the purpose of providing a better understanding by engineers, purchasing agents, and field men regarding the various chemical and physical properties of materials used in oil-field equipment.
Manufacture and Characteristics of Carbon Steel: H. W. Graham and J. H. Flaherty, Jones and Laughlin Steel Corp.
Fundamental Characteristics of Alloy Steel: E. S. Davenport, United States Steel Corp.
Wrought Iron: James Aston, A. M. Byers Co.
Corrosion Fatigue of Drill Pipe: F. N. Speller, National Tube Co.

Wednesday, November 13

Group Session
DIVISION OF PRODUCTION

9:00 A.M.

DRILLING AND PRODUCTION PRACTICE IN CALIFORNIA: (Ball Room)

(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: A. C. Rubel, Union Oil Co. of California.
Hydraulic Power Applied to Oil-Well Pumping: C. J. Coberly, Kobe, Inc.
Evaluation of Rotary-Drilling Muds: P. H. Jones and E. C. Babson, Union Oil Co. of California.
Economics of Pumping: Bruce H. Robinson, General Petroleum Corp. of California.

Group Session
DIVISION OF REFINING

10:00 A.M.

REFINING SESSION: (Music Room)

Presiding: F. W. L. Tydeman, Shell Development Co.
Chassis Lubricating Greases: R. R. Matthews, Battenfeld Oil & Grease Corp.
Improved Lubricants and Lubrication:
I. **Fundamental Chemical and Physical Forces in Lubrication:** G. L. Clark, University of Illinois; and B. H. Lincoln and R. R. Sterrett, Continental Oil Co.
II. **Practical Selection of Improved Lubricants:** L. L. Davis, B. H. Lincoln, and B. E. Sibley—Continental Oil Co.
Economics of Electric-Power Generation Compared with Purchased Power in California Refineries: R. B. Bryant and M. E. Dice, General Petroleum Corp.

Group Session
DIVISION OF MARKETING

10:00 A.M.

CODE SESSION: (Biltmore Bowl)

Presiding: C. E. Arnott, Socony-Vacuum Oil Co., Inc.
Presentation and Discussion of Proposed Voluntary Code of Fair Marketing Practices: C. E. Arnott, Socony-Vacuum Oil Co., Inc.; Chairman of Special Code Committee.

Wednesday, November 13
GENERAL SESSION

2:30 P.M.

GENERAL SESSION: (Ball Room)

Address: E. W. Marland, Governor of Oklahoma; Chairman, The Interstate Oil Compact Commission.
Address: E. O. Thompson, Chairman, Texas Railroad Commission.
Address: Charles S. Jones, President, California Oil & Gas Association.

Thursday, November 14

Group Session
DIVISION OF PRODUCTION

9:00 A.M.

RESEARCH AND OIL RECOVERY: (Ball Room)

(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: E. G. Gaylord, Standard Oil Co. of California.
The Degree of Reduction and Volatility as Indices of Source Beds (Paper on Institute Research Project 4): Parker D. Trask and Harald E. Hammar, U. S. Geological Survey.
Energy Relations in a Flowing Well (Paper on Institute Research Project 37): B. H. Sage and W. N. Lacey.
Use of Electrical Logs for Correlation in the Gulf Coast of Texas and Louisiana: Alexander Deussen, consulting geologist; and E. G. Leonardon, Schlumberger Well Surveying Corp.
Report of Division's Nominating Committee: F. F. Hill, Union Oil Co. of California, Chairman.
Election of Twenty Members of the General Committee of the Division of Production.

Group Session
DIVISION OF REFINING

10:00 A.M.

REFINING SESSION: (Music Room)

Presiding: R. E. Haylett, Union Oil Co. of California.
The Thermal Process for Polymerizing Olefin-bearing Gases: M. B. Cooke and H. R. Swanson, Alco Products, Inc.; and C. R. Wagner, Pure Oil Co.
Thermal Conversion of Hydrocarbon Gases to Gasoline: P. C. Keith, M. W. Kellogg Co.
The Petroleum Refiner Views the Development of High-Speed Diesel-Engine Fuels: William Mendius and W. Ainslee, Sinclair Refining Co.; and C. H. Schlesman, Socony-Vacuum Oil Co., Inc.
Automotive Diesel Costs: C. G. Anthony, Pacific Freight Lines.
Report of Division's Nominating Committee: L. F. Bayer, Associated Oil Co., Chairman.
Election of Twenty Members of the General Committee of the Division of Refining.

Thursday, November 14

Group Session
DIVISION OF MARKETING

10:00 A.M.

MARKETING SESSION: (Biltmore Bowl)

Presiding: R. T. Herndon, Texas Co. of California.
Economics of Marketing Petroleum Products: Howard T. Lewis, Harvard University Graduate School of Business Administration.
Advertising Petroleum Products: Don W. Francisco, Lord and Thomas Advertising Agency.
Trends in Automotive Servicing: D. G. Coombs, Shell Petroleum Corp.
Report of Division's Nominating Committee: B. I. Graves, Associated Oil Co., Chairman.
Election of Twenty Members of the General Committee of the Division of Marketing.

Group Session
DIVISION OF PRODUCTION

2:00 P.M.

DRILLING PRACTICE: (Ball Room)

(Sponsored by the Central Committee on Drilling and Production Practice.)
Presiding: W. T. Doherty, Humble Oil & Refining Co.
Evaluation of Rotary-Drilling Lines: K. N. Saatjian, Texas Co.; and V. V. Mason, Standard Oil Co. of California.
Importance of Compression Yield Strength in Establishing Setting Depths for Casing: T. McLean Jasper, A. O. Smith Corp.
Resistance to Flow of Mud Through Regular vs. Full-Hole Tool Joints: R. A. March and W. E. Gilbert, Shell Oil Co.
(NOTE: Immediately following the group session, the Central Committee on Drilling and Production Practice will meet in the Ball Room.)

Thursday, November 14

Group Session
DIVISIONS OF REFINING AND MARKETING
Joint Session

2:00 P.M.

AUTOMOTIVE FUELS: (Music Room)

Presiding: Lloyd F. Bayer, Associated Oil Co.
Rating Aviation Fuels in Full-Scale Aircraft Engines—Report of Co-operative Fuel Research Committee: Presented by C. B. Veal, Society of Automotive Engineers; Secretary, Co-operative Fuel Research Committee.
What Advantage Volatility?: G. G. Brown, University of Michigan.
Some Characteristics of Internal-Combustion Engines When Operating with Butane-Air Mixtures: C. J. Vogt, University of California.
Report of Automotive Survey Committee: A. Ludlow Clayden, Sun Oil Co.

Friday, November 15

LOCAL ENTERTAINMENT:
Golf Tournament
Field Trips

Position of President Roosevelt on Oil Placed Before I. P. A. A. Convention

By NEIL WILLIAMS

DALLAS, Tex., Nov. 5.—One of the features of the convention of the Independent Petroleum Association of America, held here Monday and Tuesday was the reading of a statement which was made by President Roosevelt to M. L. Benedum of Benedum & Trees, and Walter A. Jones of the Plymouth Oil Co., Pittsburgh, Pa., during a recent conference. The statement said that while the Government was concerned with conservation of petroleum reserves it had no desire to make a public utility of the oil industry. It warned, however, that if the industry could not work out an effective program the Government would have to take a hand.

Charles F. Roeser, Fort Worth, was elected president of the association at its closing session. He succeeds Wirt Franklin, who is retiring on his insistence because of ill health.

Other officers, all of whom were re-elected, include H. B. Fell, Ardmore, Okla., executive vice president; Russell B. Brown, Washington, D. C., general counsel; C. E. Buchner, Tulsa, executive manager, and N. T. Gilbert, general manager of the Turman Oil Co., treasurer.

The convention was called to order Monday morning by Mr. Franklin, retiring president, who, turned the chair over to Mr. Fell, executive vice president, who, in presenting his annual report, emphasized opposition to federal control, or the making of the petroleum industry a public utility, declaring, however, that he felt that the Federal government should be ready to protect state's rights. In concluding he said:

"A most important question to each of you is whether the program and the rules for the industry are to be such as to give you an equal opportunity in the industry. Personally, as a producer, I consider it is of vital importance to me to know what the program and rules with reference to imports are going to be. I am anxious to know whether the oil I produce is to have an equal opportunity in the markets of this county with the oil produced in foreign lands. It is also important to us to know whether our domestic asphalt producers are to have an equal opportunity with foreign asphalt producers in the markets in this country. The domestic asphalt producers use domestic oil and thereby increase the demand for domestic oil. We should also be interested in seeing that free imports of fuel oil for supplies for vessels bunkering at American ports is eliminated so our domestic fuel oil may have an opportunity to secure that market."

Reports by Russell B. Brown, general counsel; N. T. Gilbert, treasurer, and C. E. Buchner, executive manager, followed.

Mr. Brown said:

"There is a tendency now to make special application of legislative activity to the natural resource industries. A special study has been made of the natural resources of the United States. A special committee of Congress has studied the petroleum industry with a view to recommending proper legislation. The results of their efforts must necessarily present some problem for the consideration of Congress. Whether or not congressional legislative action will follow will be determined largely by the activities of those of us within the industry. If we are to present a justifiable protest in Washington against undesirable legislation we must be prepared to show Washington that we have a program for our own industry that will insure the orderly conservation of our natural resources and at the same time protect the enormous investments in our industry made by the American people. I do not feel that the present administration desires to make a public utility of the petroleum industry but that they would rather we would work out our own problems, but as sure as we fail to recognize the responsibility upon us, some such legislation will be proposed and will have a great deal of support. Therefore, the necessity at this time of preparing and presenting a sound program that will stand the test of observation.

"The problem of presenting a sound program of constructive activities should be heartily met by all in the industry in a united front. Because some may fail to recognize the importance of so doing should not deter us. The petroleum industry was having a depression all of its own before the far-reaching financial and industrial depression blanketed our entire country. Our depression was caused by activities within our own industry and came while we were still enjoying an increasing consumptive demand. The opportunity of initiating a program to make such self-made depressions impossible in the future is with us. It requires aggressive action and not submissive lassitude."

C. F. ROESER

The closing address Monday morning was by P. B. Flynn, Wichita Falls, Tex., past president of the North Texas Oil and Gas Association and western manager for the Reno Oil Co. His subject was "The Problem of the Stripper Well Operator." He said:

"Prior to 1920 a man who talked about conservation of petroleum, or reservoir energy, either gas or water drive, was considered a dreamer and not an efficient production man. It was considered his business to get all the oil possible out of every well every 24 hours. He was supposed to do this by letting wells flow wide open as long as they would flow. When they quit flowing he was supposed to tube them as close to the bottom as possible, pump them as hard as possible, leave the casing-heads wide open so there would be no back pressure and gradually sneak on a little vacuum, without his neighbors finding it out; never taking into consideration the effect upon his own property or his neighbors' property, and never considering the economics of the business, except in rare instances and in very few localities.

"This was not entirely his own fault, as the big purchasing companies, prior to 1920, were ever willing and anxious to extend their lines most any place to gather the oil, at a price, and put it in earthen or steel storage. Finally by degrees the management of these purchasing companies saw there had to be a stopping place somewhere to the business of storing oil, or eventually all their resources would be tied up in oil in storage.

"This practice of storing oil began to be looked upon as bad business, because this stored oil was subject to high taxes, loss by evaporation, and was a real fire hazard. A few

Statement on Oil as Approved by President Roosevelt

"Since the expiration of the NRA, efforts have been made by the constructive elements in the oil industry to hold the ground gained by the NRA. If these efforts are successful, it is suggested that the Government make it clear that it has no desire to make a public utility of the oil industry, but it is concerned with the proper conservation of petroleum resources, as well as with the development of healthy conditions in the industry.

"This conservation involves the orderly production of crude petroleum and the prevention of wasteful uses, and of the premature abandonment of wells of settled production; also the most modern and efficient refining processes and methods, and as far as lawful, a distribution and marketing plan that would stabilize this industry and insure a reasonable profit at all times to those engaged in each branch of this business.

"If the oil industry can make effective a program to accomplish these purposes without special federal legislation, well and good. If the oil industry cannot make such a program effective without the assistance of the Federal Government, then the administration may be obliged to recommend that Congress adopt proper legislation for the preservation of this valuable natural resource and for the protection of the oil industry, the interests of the consumer and of the general prosperity, and the national defense.

"It has been suggested that the various oil associations get together and appoint committees to work out an agreement or code of fair practices which may be submitted to the Federal Trade Commission for its approval. A plan of this character would allow the oil business to run its own affairs with a federal agency always in the background to see that the public is being treated fairly."

far-sighted men in the industry along with some true conservationists in state and federal offices, knew it was an actual economic waste and that all the stock that was needed on top of the ground was the necessary working stocks for pipe lines and refineries. They, therefore, contended that production would have to be controlled to consumptive demand in order to keep our industry on an even and healthy finincial keel, and, to try to prevent depression and sell out periods and abnormal peaks or boom periods.

"We have been working to this end. It has been no small job.

Walter S. Hallanan of Charleston, W. Va., president of the Plymouth Oil Co., speaking on "The Effect of the Importation of Foreign Crude Oil and Refined Products on the Domestic Market," said:

"Imports are at the heart of the problems faced by the petroleum industry. There can be no security for the producer, refiner, or marketer, unless there is a definite surety about the quantity and character of imports of foreign petroleum.

"Unless there can be this control of supplies of foreign oil, then whatever degree of success might be achieved under the Interstate Oil Compact, through the co-operation of the industry, by wisest legislation and most sincere administration of every oil state, balancing domestic supply with demand would be wasted effort. In fact, control of the domestic production, including storage withdrawals, based upon the actual demand would merely furnish a larger market at a higher price for foreign oil unless federal legislation controls these imports.

"Practical assurances which have been given many members of the industry by leaders in the present Congress would seem to indicate that at the coming session of our national legislature, we may expect some action will be taken to remedy this situation."

The Monday afternoon session was opened by Walter A. Jones, Plymouth Oil Co., Pittsburgh, Pa., on "The Relation of Government and Natural Resources." He urged greater co-operation in the industry in control of reserves. "The industry must be just as intelligent in the control of production as in the production of the oil," he said.

The feature of his talk was an account of the conference which he and M. L. Benedum had with President Roosevelt, in which the President gave reassurance to the oil industry. The statement for the President was read by Mr. Jones.

A paper on "The Small Man's Hour of Decision" was presented by John E. Shatford, El Dorado, Ark., president of the Louisiana-Arkansas Refiners Association, and of the Independent Oil and Gas Association of Kansas. Among other things he said:

"Let us consider the pipe lines. Let me say that divorcement is a proposal with which, for the present at least, I do not agree for the reason that there yet appears no practical method of dispossessing the present owners or setting pipe line operations apart without serious disturbance to the structure of the industry. But it should be noted that if present management and ownership of pipe lines object to divorcement because it would do violence to their rights and to the present economic structure of the industry they should be careful not to employ their present opportunities to produce these same results upon victims of their own choosing. On the other hand there should be a more rigid federal regulation of pipe lines than we have yet experienced."

H. D. Atha, president of the Oil and Gas Association of Michigan, Mount Pleasant, Mich., presented extemporaneously a picture of the Michigan oil situation. He said that although the extent of reserves still is not known, there are great potentialities.

H. B. FELL

M. L. BENEDUM

RUSSELL B. BROWN

C. E. BUCHNER

An open forum on "Known Oil Reserves," led by Marvin Lee, Wichita, Kans., secretary and technical advisor, Kansas State Corporation Commission, created considerable interest. Mr. Lee brought out that increasing costs of exploration, development and production would be an important factor in the development of additional reserves and that the development of new reserves would depend to a large extent on the justification of these costs with the price of oil.

H. J. Struth, petroleum economist, Houston, Tex., addressed the association Tuesday morning on "Economics of the Petroleum Industry."

Wilmer R. Schuh, Milwaukee, Wis., president of the National Association of Petroleum Retailers, Inc., addressed the meeting on the relation of the independent marketer to the independents in other branches.

Resolutions Adopted

The association went on record as supporting the following program:

First, federal legislation definitely limiting importation of petroleum and products, preferably to a fixed proportion.

Second, orderly withdrawals from storage.

Third, some practical method whereby domestic production shall be held within the limits of national demand with each state, so far as possible, assured of its equitable and proper share.

Fourth, planned, orderly development of new pools by agreement of operators.

Fifth, voluntary agreements within the industry, subject to approval by some federal agency.

The association, although positively opposed to federal control, placed itself on record as convinced a national problem required a national program and that the assistance of the Federal Government may be invoked properly to protect the oil-producing states in interstate situations where the laws of the single states have no authority, the association pledged its active support to the interstate oil compact and commission.

Opposing the steadily increasing burden of taxation on the industry, the association passed a resolution to petition Congress to eliminate the federal sales tax on gasoline and lubricating oil, and to petition the state legislatures to reduce taxes on petroleum and products and prevent diversion of gasoline taxes from highways.

That pumping or stripper well production, more than 60 per cent of the reserves, cannot be continued at present crude price levels, and that present crude prices are approximately 50 per cent below the natural economic level compared with other commodities, was the gist of a resolution favoring an immediate increase in posted prices. The resolutions condemned the practice of some companies in posting lower prices for new or isolated fields, or those fields which have no competitive pipe line connections, where such discrimination in price is not justified. They also condemned selling either crude or products below average costs, and urged the industry to consider some legal method by which this might be eliminated.

Other resolutions condemned alleged discrimination against the use of domestic asphalt and requested Congress investigate the Bureau of Public Roads ruling that American products used in construction of highways under federal appropriations shall not apply to asphalt although ample supplies of American asphalt are available at a fair price, and also requested the procurement division of the Treasury Department to rescind its order exempting foreign asphalt from the provision of the domestic origins law.

It was urged the industry consider methods to prevent excessive withdrawals of oil from storage, and that no withdrawals be made during winter months; that Congress make adequate appropriation for continuance of statistical work and recommendations by the Bureau of Mines; and that the American Bar Association be requested to make a thorough investigation of alleged racketeering and unethical practices indulged in by some members of legal profession in the industry which obstruct legal procedure.

Members of the executive committee, including Mr. Franklin, Mr. Fell, Mr. Roeser, J. Steve Anderson, Oklahoma City; H. D. Atha, Mount Pleasant, Mich.; J. S. Bridwell, Wichita Falls, and H. M. Stalcup, Tulsa, were re-elected. It was voted to include the immediate past president and the treasurer as ex-officio members. As Mr. Franklin already is a member, a vacancy was created, to which place Ralph Zook of Bradford, Pa., was selected.

The mid-year meeting will be held at Tulsa during the International Petroleum Exposition. Oklahoma City was selected for the next convention.

The convention was closed Tuesday night with a dinner dance at which Mr. Roeser presented Mr. Franklin with a testimonial in behalf of the association in appreciation of his six years' work with the organization.

Early Introduction of 1936 Model Cars to Greatly Aid Gasoline Consumption

By C. O. WILLSON

NEW YORK, Nov. 3.—Two months ahead of the usual time, the New York Automobile Show, sponsored by the Automobile Manufacturers Association, opened here today with nearly 300 1936 cars and chassis on display. The early show is an experimental effort on the part of the car manufacturers to change the buying habits of some of their customers and enlarge late fall and winter purchases of new cars and thus reduce wide seasonal variations in plant operations and employment.

If successful the plan will have significance to the oil industry from the standpoint of motor fuel and motor oil consumption. To a lesser extent it may stimulate the fall and winter demand for heavy residual fuels used by the automobile and closely allied industries. If the automobile manufacturers sell a large number of their cars over the next 60 days they will reverse the usual situation in which sales decline to a minimum. These new cars will be on the highways through the winter months and swell the demand for fuels and lubricants during that period. Aside from the plan of spreading employment there is a feeling among car manufacturers that seasons are becoming less and less important in car operations. Improved highways and the perfection secured in all features of design has made car operation for the average owner an all-year proposition, with winter touring rapidly becoming more important.

It is also said that the introduction of new models at this time will aid the export business which is of direct importance to the oil industry. The car manufacturers will be able to enter the markets of the Southern Hemisphere with new cars at the start of the major buying season.

The early introduction of 1936 cars will no doubt aid the demand for motor fuels this year and the oil industry in this country is apparently assured another increase in domestic sales next year. New car and truck production this year, according to estimates, will total 3,700,000, a gain of 28 per cent over 1934 and 250 per cent greater than the 1932 output. Of the total production 535,000 units will be exported. Domestic gasoline demand in this country for the first eight months of this year was 5.5 per cent greater than 1934, the previous peak, and during the summer months the percentage increase was substantially higher than the average figure. Various estimates have been made as to the probable car production in 1936, with top figures running from 5,000,000 to 6,000,000. More conservative estimates are heard among the manufacturers with totals running from 4,000,000 to 4,250,000. Of this total probably 625,000 to 650,000 cars will be exported and thus aid in swelling the demand for gasoline outside this country. The conservative estimates would point to at least a small increase in demand for gasoline in this country with larger gains in several foreign countries which have shown phenomenal expansion this year, due both to the availability of American cars and increased output of foreign cars.

Turning to design of the new cars which are of direct significance to the oil business, one finds the trends of previous years continuing with more emphasis placed on economy in the use of these products. While pre-show predictions indicated there would be few changes in compression ratios the accompanying table shows that the average increase for 18 representative models will be about the same as previous years. There has been a corresponding increase in horsepower rating of several cars. The average compression ratio of 6.12 to 1 represents a gain of .13 over the 1935 models and an increase of 1.16 since 1931.

Statements of car manufacturers indicate that they are familiar with the fact that the anti-knock ratings of motor fuels continues to improve and there is a desire on their part to take full advantage of this development in the design of their engines. At the same time it is apparent that they have no intention of going to ratios which will necessitate premium fuels. Even the manufacturers of many of the most expensive cars want it made clear that their engines do not require premium fuels and in the case of the medium and low priced cars where fuel economy has become an important selling feature, the fact that regularly priced gasoline gives maximum performance, is always stressed.

The new instruction manuals and owners' handbooks devote considerable space to lubrication. To obtain the comfort, safety, compactness, easy control and general improvement in appearance of the 1936 models, it has been necessary to place more emphasis on body and chassis lubrication and the manufacturers have available detailed charts and instructions. The seasonal conditions which require changes in specifications for oils and greases, although only small quantities are used, is pointed out.

In regard to engine oils, a comparison of recommendations for the 1936 models and those of previous years shows that the trend toward lighter oils continues. The heaviest oil suggested by most car manufacturers is now S.A.E. 30 for summer use, with the lighter oils recommended over a greater part of the year. The accompanying chart, which in the form of a sticker is placed in all the 1936 Pontiacs at time of delivery to buyers, reflects this trend. The Chrysler recommendations for their several models, including Plymouth and Dodge, are as follows:

ENGINE OIL—SUMMER

Nomal operating conditions—S.A.E. 30 for temperatures ranging from +40° F. (+4° C.) to +110° F. (+43° C.).
Continued high speed driving or, for prevailing air temperatures from +70° F. (+21° C.) to +110° F. (+43° C.) —S.A.E. No. 40.

ENGINE OIL—WINTER

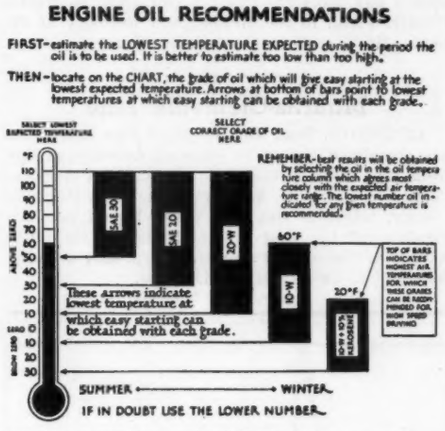
During cold weather it is advisable to use a low cold test oil, having the body of viscosity No. 10W or No. 20W, in order to obtain sufficient cranking speed to insure easy starting.
For conditions when the minimum anticipated air temperature is +32° F. (0° C.) and the maximum anticipated air temperature is +80° F. (+27° C.) use either S.A.E. 20 or No. 20W.
For conditions when the minimum anticipated air temperature is +10° F. (—12° C.) and the maximum anticipated air temperature is 80° F. (+27° C.), No. 20W only, should be used.
For conditions when the minimum anticipated air temperature is —10° F. (—23° C.) and the maximum anticipated air temperature is +45° F. (+7° C.), No. 10W only, should be used.
For conditions when the minimum anticipated air temperature is —30° F. (—34° C.) and the maximum anticipated air temperature is +20° F. (—7° C.), use No. 10W plus 10 per cent kerosene.

OIL USED IN NEW CARS AND RECONDITIONED CARS

Under no circumstances should an oil having a body heavier than that of S.A.E. viscosity No. 20 in the summer and No. 10W in the winter be used in the engine for the first 500 miles (800 km.). For the first 2,000 miles (3,200 km.) the oil should not have a viscosity greater than S.A.E. No. 30.

It is apparent that these recommendations for the lighter oils fit into the trend toward solvent refining in the manufacture of motor oils at refineries. The car manufacturers have wanted the lighter oils for several years, but not until refiners were able to manufacture these oils so that they would "stand up" under operating conditions were they able to make definite recommendations for their use. The advent of solvent refining with general improvement in properties of finished products has aided the refiners is making these oils available.

As previously indicated the representatives of the car manufacturers are pointing to new features which they claim make for economy in the use of gasoline and motor oils. The overdrive unit first introduced last year by Nash, Chrysler, DeSoto and Studebaker, on some models, has been adopted as standard or optional equipment by additional manufacturers. With the overdrive the speed of the engines is reduced from 30 to 40 per cent with resulting economy, of which gasoline and oil are a part. Auburn has what is called "dual ratio rear axle" through which the engine speed is reduced one-third. Hupmobile has a "superdrive," a dual ratio rear axle which comes into play when the car attains a speed of 40 miles an hour, reducing the engine speed by about one-third with a saving in gasoline and oil consumption.


ENGINE OIL RECOMMENDATIONS
FIRST—estimate the LOWEST TEMPERATURE EXPECTED during the period the oil is to be used. It is better to estimate too low than too high.
THEN—locate on the CHART, the grade of oil which will give easy starting at the lowest expected temperature. Arrows at bottom of bars point to lowest temperatures at which easy starting can be obtained with each grade.
SELECT LOWEST EXPECTED TEMPERATURE HERE
SELECT CORRECT GRADE OF OIL HERE
REMEMBER—best results will be obtained by selecting the oil in the oil temperature column which agrees most closely with the expected air temperature range. The lowest number oil indicated for any given temperature is recommended.
SAE 30
SAE 20
20-W
10-W
10W-30
60°F
20°F
TOP OF BARS INDICATES HIGHEST AIR TEMPERATURE FOR WHICH THESE GRADES CAN BE RECOMMENDED FOR HIGH SPEED DRIVING
These arrows indicate lowest temperature at which easy starting can be obtained with each grade.
SUMMER
WINTER
IF IN DOUBT USE THE LOWER NUMBER

Sticker placed in all 1936 Pontiac cars showing seasonal recommendations for motor oils. Recommendations of the most of the other manufacturers are similar

Trend in Compression Ratios of Leading Cars During Past 6 Years

Car model, 1936—	1936 Std.	1936 Option.	1935	1934	1933	1932	1931
Auburn 654	6.20	....	6.20	6.20	5.26	5.26	....
Buick 60	5.45	....	5.25	5.25	5.25	5.09	4.75
Cadillac V-12	6.00	5.65	6.00	6.25	5.60	5.30	....
Chevrolet, Master 6	6.00	....	5.45	5.45	5.20	5.20	5.02
Chrysler DL 8	6.20	7.00	6.20	5.20	5.20	5.20	....
Dodge 6	6.50	....	6.50	5.50	5.50	5.35	5.20
DeSoto AS6	6.00	7.00	6.00	6.20	5.35	5.35	....
Ford V-8	6.30	....	6.30	6.33	6.33	5.51	4.22
Graham, Special 6	6.80	....	5.80	6.50	6.50	6.50	....
Hudson 8	6.00	7.00	6.00	5.80	5.80	5.80	5.80
Hupmobile	5.80	....	5.75	5.75	5.75	5.40	....
Lafayette	5.54	5.73	5.54	5.30	....	....	....
Nash 8	5.25	....	5.25	5.25	5.10	5.10	5.00
Oldsmobile 8	6.20	....	6.20	5.70	5.50	5.90	....
Packard 8	6.50	....	6.50	6.00	6.00	6.00	....
Plymouth 6	6.70	....	6.70	5.80	5.50	4.9	4.6
Pontiac 8	6.20	....	6.20	6.20	5.70	5.20	4.9
Studebaker Pres. 8	6.50	....	6.00	6.30	5.50	5.20	5.2
Average	6.12		5.99	5.83	5.59	5.50	4.96

Note: So far as possible cars listed for 1935, 1934, 1933, 1932 and 1931 were comparable as to model with those shown for 1936.

Pipe Line Progress

New Kansas Line Progressing Rapidly Toward Completion

Construction is progressing rapidly on Socony-Vacuum's 8-inch line from the Hollow Pool in northern Harvey County to the Chase Pool in Ellsworth County. All pipe has been strung and welders are now working within 20 miles of the Chase Pool terminal station which is under construction at the present time. Truman and Smith of Eldorado, Kans., are contractors on this line. It is expected this section of the line will be finished by the first of the coming year.

The Kaw Pipe Line Co. line from the Socony-Vacuum station to the Gorham Pool in western Russell County is now under construction with the firing line now well past the northern limits of the Chase Pool. This section of the line has been held up because of lack of pipe. This pipe is being furnished from lines being abandoned in southern Oklahoma and northern Texas, transportation being made by truck.

Samfordyce to McAllen Line Contracts Are Awarded

HOUSTON, Tex., Nov. 4.—Contracts for a 30-mile 4-inch welded gas line from the Samfordyce Field in Hidalgo County to terminal points about 15 miles east of the city of McAllen are reported to have been awarded the Freddell Construction Co. of Houston and Denver, and actual construction is expected to get under way within a few weeks. The line is being financed by a group of independents composed of Showers & Moncrief, Inc., of Houston, Roy Moyston of Corsicana and Murchinson & Closuit, Inc., of Dallas.

Gas System for Lavaca

HOUSTON, Tex., Nov. 4.—Construction of a gas distribution system in Port Lavaca will start immediately according to announcements made by the Houston Natural Gas System. The gas will be supplied from wells owned by the Halliburton Producing Co., about 2½ miles north in the Port Lavaca Field. Construction has been delayed on account of the construction of a complete water and sanitary system, which is nearing completion. The franchise for the system which was granted to Lavaca Gas Co. several months ago has been assigned to Texas Natural Gas Utilities, a subsidiary operating company of the Houston Natural Gas System that has secured sole rights for the gas produced by Halliburton Oil Producing Co. A short line has already been laid to the new public school building, which will be the first user of natural gas in the city.

Leuders Pool Outlet

FORT WORTH, Tex., Nov. 4.—The Texas and Magnolia pipe line companies have been checking the newly opened Lueders Pool in northeast Jones County, but have not intimated that a line would be laid by either. Guiberson Oil Corp., which has associate companies operating in the pool, has also been checking with regards to installing a gathering system in the pool in which there are three producers and seven tests drilling. One test has been abandoned 1 mile east of the pool and another about 3 miles northwest was abandoned by D'Arman and Shelton on the Huffaker farm in Section 25, D.&D.A. Lands Survey. A small refinery at Leuders, owned by the Panhandle Refining Co., is the only outlet for the pool, connected by a 3-mile line.

Skelly Line to Lorraine Pool

Extending its lines from Hutchinson to Chase with the recent purchase of an old 6-inch of the Central Kansas Pipe Line Co. the Skelly Oil Co. has also completed purchase of right of way for an extension of this line from the Chase Pool to the Lorraine Pool of Ellsworth County, in Kansas. The Osage Construction Co. has been awarded the contract for laying this extension to the Skelly pipe line system. Construction on this extension is scheduled to start at once.

Skelly has six big producers in the Lorraine Pool with a daily potential of 12,976 bbls. from the Siliceous lime to support the construction of the extension with other probable connections.

Complete Michigan Line

McClanahan Pipe Line Co. has completed a new 4-inch line with a capacity of 6,000 to 8,000 bbls. a day from the Crystal Township, Montcalm County, Field, to the McClanahan Refinery at St. Louis, Mich., a distance of about 20 miles.

Mauritz-Clemville Line

HOUSTON, Tex., Nov. 4.—Shell Pipe Line Corp. has completed laying 14 miles of 4-inch pipe line from the Mauritz Field in northeastern Jackson County to Clemville, near Markham, in Matagorda County, where it ties into Texas Pipe Line Co.'s 8-inch trunk line that runs to Houston. The oil is being run for Shell Petroleum Corp. and is being delivered to its refinery at Houston.

H. D. Kelly, construction superintendent, and Harvey Power, secretary and treasurer, White Deer Pipe Line Co.

Natural Gas

Natural Gas Production and Consumption During 1934

The marketed production of natural gas, which had been adversely influenced by the depression in 1931, 1932, and 1933, registered a notable recovery in 1934, when the total output was 14 per cent above the level of 1933, according to the United States Bureau of Mines. The total output in 1934 was 1,770,721,000,000 feet, compared with 1,555,474,000,000 feet in 1933 and with 1,943,421,000,000 feet in the peak year of 1930. Although the distribution of natural gas for domestic purposes increased slightly, the major portion of the recovery in total distribution in 1934 was due to a material gain in demand for industrial purposes.

The downward trend in the value of natural gas at the wells, which began in 1929, was continued in 1934 when the producers received an average of 6.0 cents per 1,000 feet, compared with an average of 6.2 cents in 1933. As in most recent years, the decrease in the average well value conformed to the decline in Texas, the leading producing state. If it were not for the consumption of large quantities of 2-cent gas in Texas for field purposes and in carbon-black manufacture, the national average would be considerably above 6 cents; in fact, the producers in some states receive more than 20 cents per 1,000. Although the average price paid by domestic and commercial consumers increased slightly in 1934, the decline in the average industrial price was sufficient to cause the average value of the entire production at points of consumption to decline from 23.7 cents per 1,000 feet in 1933 to 22.3 cents in 1934.

The total consumption of natural gas, or production (1,770,721,000,000 feet) plus imports from Canada (68,000,000 feet) minus exports to Canada and Mexico (5,801,000,000 feet), amounted to 1,764,988,000,000 feet. Of this total 554,542,000,000 feet (31 per cent) was used for field purposes; 288,236,000,000 feet (16 per cent) was used by domestic consumers; 91,261,000,000 feet (5 per cent), by commercial consumers; 229,933,000,000 feet (13 per cent) was consumed in carbon-black manufacture; 127,896,000,000 feet (7 per cent) was consumed at electric public-utility power plants, 79,965,000,000 feet (5 per cent), at petroleum refineries; and 27,331,000,000 feet (2 per cent), at cement plants, leaving 365,824,000,000 feet (21 per cent) consumed for "other" industrial purposes. Compared with 1933, these data indicate chiefly gains in the ratios for carbon black and refinery consumption, balanced by a decrease in the ratio for domestic consumption.

The number of domestic and commercial consumers of natural gas in 1934 was 7,566,000, compared with 7,232,000 for the previous year. Included in the 1934 figure are 2,147,000 consumers of mixed gas, compared with 2,038,000 in 1933.

The number of gas wells completed increased from 932 in 1933 to 1,373 in 1934, but the number of producing gas wells declined from 53,660 on December 31, 1933, to 53,260 on December 21, 1934.

The number of employes in the natural gas industry, as reported by the distributors, increased from 48,500 on December 31, 1933, to 52,300 on December 31, 1934.

The total interstate and export movement of natural gas rose from 346,810,400,000 feet in 1933 to 414,183,000,000 feet in 1934, an increase of 19 per cent. The proportion of total natural gas consumption moved in interstate and foreign commerce increased in 1934, a development which resulted more from the increased shipments through established systems than from operations of new lines.

Commission Begins Valuation of Systems in Texas Towns

AUSTIN, Tex., Nov. 4.—Chairman Ernest O. Thompson announced the railroad commission has begun physical valuation of the gas distribution systems in over 125 small cities receiving gas at the city gates from Lone Star Gas Co., and served locally by Community Natural Gas Co. The action followed a recent appellate court decision upholding the commission's order in the Lone Star case directing the gate rate be cut from 40 to 32 cents per 1,000 feet for domestic use. The commission already has been at work on physical valuation of systems in cities of 1,000 to 2,000 population, and will continue through the smaller cities and towns.

Waste Gas Process

CHATHAM, Ontario, Nov. 2.—Turner Valley operators are interested in the announcement by officials of the National Research Council of a new process for the production of synthetic gasoline from waste natural gas. The Turner Valley Field produces approximately 250,000,000 feet a day, from which naphtha is extracted by separators and three gasoline absorption plants. The latter ensure practically complete recovery of naphtha from the gas treated. Of the residual gas, an average of 25,000,000 feet a day, with a peak of around 50,000,000 to 60,000,000 feet, is marketed by the Canadian Western Natural Gas, Light, Heat & Power Co., or otherwise utilized commercially.

Natural Gasoline

Natural Gasoline Output at New High in September

The output of natural gasoline reached a new high level for the year in September, according to a report prepared by the Bureau of Mines. The daily average output was 4,483,000 gallons, compared with 4,150,000 gallons in August and with 4,303,000 gallons in September, 1934. The gain in production in September, 1935, resulted primarily from increased operations at certain "stripper" plants in the Panhandle which had shut down because of the gas wastage law. The daily average output of natural gasoline in the Panhandle in September was 650,000 gallons, or about 85 per cent of "normal." The production at Kettleman Hills and Oklahoma City also increased materially in September. Stocks of natural gasoline reflected the increased refinery and export demand, the total declining from 234,276,000 gallons the first of the month to 215,586,000 gallons on hand September 30.

Exports of natural gasoline in September totaled 308,000 bbls., a material increase over August. All of the gain was recorded in California, in fact, shipments from the other districts declined. The refinery demand for naturals showed the usual seasonal increase, but the "direct" movement to jobbers and retailers showed little change.

Natural Gasoline Corp. to Build Plant in New Mexico Field

The Warren Petroleum Co., through its subsidiary, the Natural Gasoline Corp., will begin construction immediately on a 40,000-gallon natural gasoline plant to be located in the S ¼ Section 36e-19s, Lea County, New Mexico. Surveys are being made for locating the equipment, the initial operation to utilize well pressure and later compressors and auxiliary equipment will be added. Gasoline production is expected to be between 6,000 and 7,000 gallons per day at the time operation begins and a tentative schedule calls for starting the plant within 90 days. Production will be increased as new connections are made to wells now drilling and to be drilled.

The area to be served covers 48 square miles and 60 miles of gathering lines of sizes including 12, 8, 6 and 4-inch. At the present time connections are planned for 50 wells and as the field is developed, between 150 and 200 wells will probably be connected. The gasoline content of the gas indicates a plant recovery of between 1½ and 2 gallons per 1,000 feet.

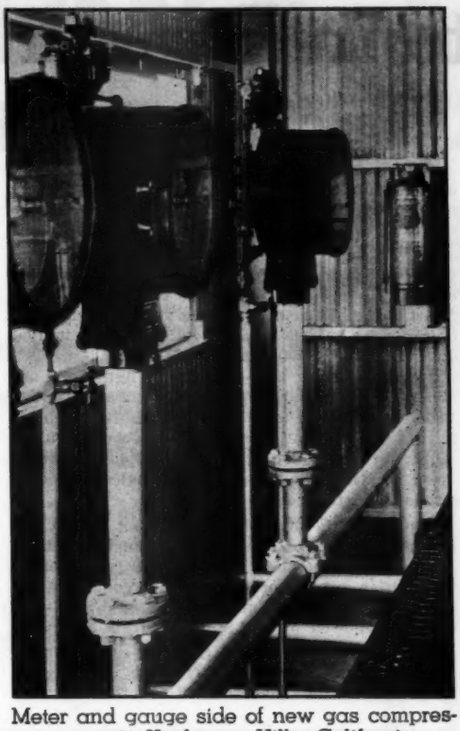
The properties under development by Warren were a part of the purchase made from the Amerada Petroleum Corp. several weeks ago and much of the gas to be processed will come under the gas contracts originally held by Amerada.

Production of Natural Gasoline Increased in California

Natural gasoline production during the month of September increased 3,000 bbls. daily, and refinery utilization registered a like increase and amounted to 36,000 bbls. daily, according to the Bureau of Mines report. The September daily average was 37,000 bbls. compared with a daily average of 34,000 bbls. in August. Shipments increased 5,000 bbls. daily to 6,000 bbls. daily. Stocks decreased 9,000 bbls. daily during the month to 1,851,000 bbls., which was 920,000 bbls. less than stocks as of the end of September last year. Both refinery utilization and shipments to date this year are running 2,000 bbls. daily ahead of last year, amounting to 29,000 bbls. daily and 3,000 bbls. daily, respectively. There were 89 plants in operation during the month with a daily capacity of 2,037,500,000 cubic feet. There were 28,115,854,000 cubic feet of gas treated during the month producing a total of 46,578,310 gallons of natural gasoline.

Daily average production of liquefied petroleum gases decreased from 1,182 bbls. to 1,155 bbls., of which 221 bbls. was produced at refineries in September. Daily average sales decreased from 919 bbls. to 1,283 bbls.

Still gas production during September amounted to 1,391,661,000 cubic feet, equivalent on a B.t.u. basis to 331,784 bbls. of fuel oil.



Meter and gauge side of new gas compressor unit, Kettleman Hills, California

Refinery Work

Standard of California to Add Poly and Hydrogenation

The Standard Oil Co. of California has set aside $600,000 for the immediate construction of a polymerization unit at its Richmond refinery located in the San Francisco Bay region and tentative plans also contemplate construction of a hydrogenation unit to be used in conjunction with the polymerization plant through the combination of which the company's research engineers expect to produce a gasoline with a 100 octane rating or higher. Construction of these units the first on the Pacific Coast will permit the utilization of gases that have hitherto been used only for fuel under boilers and stills at the refinery. No engineering details have been released up to the present time although the company's announcement states that "the company's research staff has developed refinements of the new process of great value."

The Standard recently spent approximately $1,800,000 in modernization of equipment at the Richmond refinery and is at the present time constructing a new refinery in Vancouver, British Columbia. This expenditure permitted the construction of a combination atmospheric and vacuum crude oil unit, solvent treating and recovery plant lubricating oil vacuum rerun unit, increased pipe line and wharfage facilities, additional tanks and a booster plant at the end of the Richmond wharf. The installation of this additional equipment was but one phase of the Standard's general expansion program undertaken early this year and which is closely tied in with the revision made in the company's pipe line system in the San Joaquin Basin and additions made to marine loading facilities at the El Segundo refinery in southern California.

Naph-Sol to Add New Boiler Plant and Refinery Office

MUSKEGON, Mich., Nov. 4.—A $35,000 building program, including the construction of a new office building and a new boiler plant east of the North Muskegon city limits was announced last week by Walter E. Anderson, president and general manager of the Naph-Sol Refining Co.

Contracts for the new $12,000 office building already have been let. Bids will be taken soon on a new boiler plant to house a 500-horsepower boiler, water softener and other equipment comprising an installation to cost from $20,000 to $25,000, according to preliminary estimates.

The Naph-Sol company, first independent refinery in Michigan to install a cracking unit, already has expended about $250,000 in plant improvements this year.

Start Swanson Refinery

The Swanson Co., a new $150,000 Michigan corporation, will start construction soon on a 1,500-bbl. plant in Battle Creek, Mich.

Elmer Swanson, head of the Swanson Oil Co., independent operating concern in the Crystal Township, Montcalm County, Field of central Michigan, announced the plant will be designed and built under the direction of Roy J. Miller, of Chicago. Mr. Miller recently had charge of the expansion of the Sweet Oil refinery at Wyman, Mich.

Enlarge Kent Refinery

Daily runs of the Kent Refining Co., of Grand Rapids, Mich., will be increased from 1,000 to about 1,500 bbls. after improvements and expansion now under way are completed. The company has acquired 90 acres adjoining its plant site for present and future expansion, it was announced by J. B. Ryan, sales manager. A 70-foot fractionating tower is being erected. A new boiler has just been completed and a new 250-bbl. agitator has been installed. Four new 25,000-bbl. storage tanks will boost storage capacity to more than 500,000 bbls. Loading facilities have been increased from 25 to 35 tank cars by a recent siding extension.

Reopen Hutchinson Refinery

The Hutchinson, Kans., plant of the Hutchinson Oil & Refining Co. is scheduled to be reopened within the next 30 days, following a refinancing plan by A. B. Conner, one of the principal stockholders. The refinery, which has been closed down for more than a year, has a daily capacity of 1,500 bbls. Saunders Petroleum Co. of Kansas is understood to have agreed to take half the output of the plant when it is opened.

Texas Pacific Closes Plants

The Fort Worth, Tex., refinery of the Texas Pacific Coal & Oil Co. has been shut down and will remain so indefinitely, however the plant will continue to compound oils and greases. The reason for closing the plant was stated as being due to the obsolescence of the refining equipment, part of which will be removed. The company will continue to operate its Veale plant, having secured a contract, covering a period of several years, for the entire gasoline output of this refinery.

Start New Michigan Plant

Construction of the new 1,500-bbl. plant of the Inland Refinery Co. at Pontiac, Mich., was started last week and is expected to be completed on or before January 1.

The Grand Trunk Western Railway will lay a 1,000-foot siding on the 13-acre tract alongside its right-of-way, where the plant will be built. Construction work is progressing under the direction of E. G. Guy, designer and builder of several Michigan plants.

League Powers May Ask United States to Cooperate in Ban on Oil to Italy

By C. O. WILLSON

NEW YORK, Nov. 5.—Announcement that financial and economic sanctions of the League of Nations authorized by 52 nations will become effective not later than November 18 presumably will bring to a head the matter of furnishing oil supplies to Italy.

The consensus of opinion now is that the sanctions to become effective November 18 do not place an embargo on petroleum although movement probably will be restricted due to ban on imports from Italy and on extension of credit. It is also felt that sanctions will shortly be extended to include petroleum.

Reports today indicated that Great Britain and major powers which are members of the League of Nations will attempt to secure the co-operation of the Government of the United States in placing an embargo on oil shipments to Italy. The countries that are parties to the League sanctions against Italy which are to become effective November 18 are anxious, it is said, to include an embargo on oil shipments but are fearful that their action will be nullified through increased sales from the United States.

While no official announcement has been made, administration authorities at Washington apparently are not certain that the President has authority under the neutrality act to include oil among the products which cannot be shipped to belligerents.

It is also said that certain trade agreements with Italy might be violated if this action was taken. The attitude of local oil companies is to continue the shipments of oil until such time as a change in policy is indicated in Washington.

Considerable publicity has been given to Washington dispatches showing that oil shipments to Italy increased 600 per cent in August and September. An analysis of these figures shows their unimportance so far as the oil business is concerned and also the small part they play in the total supplies of Italy.

Shipments to Italy

The data from Washington indicated that the shipments from this country to Italy for the two months averaged about 6,000 bbls. daily and for the first nine months of this year a little over 5,000 bbls. daily. Normal shipments to Italy from the United States are approximately 3,800 bbls. daily. If the August and September figures are correct the increased war business with Italy amounted to 2,000 bbls. in an export market from this country which has totaled approximately 335,000 bbls. daily so far this year. The 6,000 bbls. daily would be approximately 12 per cent of Italy's total oil imports at this time, the remainder coming from other countries.

Unless additional action is taken at Washington exporting companies here will follow the policy explained two weeks ago by the Standard Oil Co. (New Jersey). Announcing it had not been approached by Anglo-Iranian Oil Co., Ltd., and Royal Dutch-Shell in regard to shutting off shipments to Italy if they adopted that policy under sanctions, the Jersey company explained it saw no reason why it should not continue its operations in Italy established many years ago. It is apparent this company and other American organizations will continue to accept Italian business unless this trading is forbidden by new policies at Washington.

It has been pointed out that operations of certain American and foreign companies are so widespread with subsidiary or affiliated incorporations in many countries that these companies in some instances probably could continue to sell to Italy despite sanctions and any prohibitions or limitations that may be adopted in this country. One authority is certain there are adequate oil supplies for Italy outside the control of the League of Nations and the United States provided it has the cash to pay for them.

While some have pointed to sanctions as a bullish development for the oil markets of this country, a majority is fearful of reaction. Data for the first six months of this year show imports of crude and refinery products into Italy totaled approximately 1,200,000 bbls. monthly or 40,000 bbls. daily. They have increased, but it is not believed the gain has been more than 10,000 or 15,000 bbls. daily. Spot purchases in this country have increased in part because other countries could not make delivery quickly. Some business is on the books of American companies for delivery later in the year.

Normally the United States is not one of the major suppliers of petroleum products in Italy except lubricating oils. For the first six months the Italian oil imports from this country were about 10 per cent, Rumania leading by a wide margin, followed by U.S.S.R. and Iran.

Should U.S.S.R., Iran, Iraq and certain other foreign countries be shut off from shipping to Italy, they would have to look to other markets to absorb the volume normally sent to Italy. This might seriously disturb the European markets, which, considering disturbed political conditions, have been showing remarkable stability with indications for further improvement next year.

It is not assured Italy would attempt to buy her supplies from this country, assuming our neutrality policy continues to permit export of petroleum products. Part of the Italian oil purchases have been based on trade agreements with countries in which Italian products were purchased. Private credit on a large scale would not be obtainable in this country and reciprocal trade agreements require months to work out.

It is probable Italy, for a time at least, will rely on its stored oil and its outside purchases will be reduced to a minimum when sanctions become effective. Italy's oil policy for over a year has been directed toward accumulating oil supplies and it is estimated Italy has supplies to cover requirements from three to six months. Her actual use of these supplies in Ethiopia so far has been small and unless the war spreads, Italy has no immediate worries in regard to oil.

Phillips Holds Two-Day Group Meeting for Production Men

Charles P. Dimit, vice president in charge of production for the Phillips Petroleum Co., was host on Wednesday and Thursday in Bartlesville to a large number of the company's division superintendents, foremen and other key men. Provision was made in the two-day session for four business meetings during which papers were read on subjects which covered practically every phase of modern production practices. Talks were made by Frank Phillips, president; John H. Kane, executive vice president; R. H. Hudson, general counsel; M. P. Youker, vice president in charge of refining, and F. E. Rice, vice president in charge of natural gasoline plants.

Arrangements for meetings and the group sessions were in charge of D. R. Knowlton, general superintendent, and the men delivering papers included T. J. Hamilton, Earl Griffin, Ralph Clark, B. F. Laughery, Austin Allen, C. E. Sturdevant, C. M. Oden, M. L. Atkinson, W. J. Crites, P. E. Loye, C. M. Rader, R. E. Jolly, A. R. O'Brien, H. L. Baldwin, Jr., D. F. Gunby, D. A. McGee, R. G. Ralph, K. E. Beall, C. A. Daniels, L. J. Pratt, H. L. McQuiston, G. D. Gunn, C. E. Klein, J. P. Stephens, and L. H. Thawley. P. C. Murphy presided during the afternoon session on Thursday.

One of the largest Diesel tankers afloat, the Australia, capacity 145,000 tons, delivering cargo at bulk terminal at Tsum Wan, Hong Kong, China

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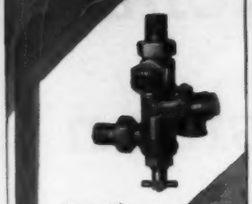
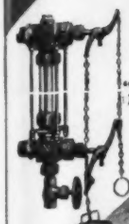

Automatic Injector

Ejector, Syphon or Jet Pump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PENBERTHY PRODUCTS

350 LBS. W. S. P. AT 500° F.

HERE is a water and liquid level gage that has no superior in design, materials and workmanship. It is used where only the best is good enough—and it has frequently proved the least expensive in the long run.

Ball type safety valves are located in each gage arm to automatically and positively close when the glass is broken. Ball in lower valve must be lifted to seat and cannot close unless glass breaks; this absolutely prevents a false water level from being shown. The shut-off valves are arranged for easy regrinding. Packing glands prevent any torsional stress on glass when packing nuts are drawn down.

The gage arms are self-cleaning. The glass is offset from stems for cleaning from either end without loosening glass packing or valves. A separate drain valve, union nut and tail are furnished; valve can be connected directly to gage or placed wherever most convenient.

The "Navy Type", like other Penberthy water and liquid level gages, is carried in stock by supply houses everywhere.

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DETROIT, MICHIGAN • *Manufacturers of Quality Products Since 1886* • WINDSOR, ONTARIO

Screw Plunger Grease Cup

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Dipless Air Cock

Oil Company Earnings for 9 Months Show Industry's Improved Position

The aggregate net income of 13 representative oil companies for the nine months ended September 30 amounted to $53,384,327, an increase of 35 per cent over the total of $39,550,044 for the same period in 1934, according to a report compiled by Carl H. Pforzheimer & Co., New York City. The total net income of these companies for the third quarter ended September 30 was $24,290,026, an increase of 31 per cent over the same period of 1934. For the June quarter these companies reported earnings approximately 63 per cent above the same quarter in 1934, while in the first quarter their earnings were only 7 per cent above the initial period of last year.

A study of the earning statements in connection with the operations of the individual companies shows the significance of local conditions, market trends, and type of operations. The collapse in the crude oil and gasoline markets in California in late August affected adversely the third-quarter earnings of the major operators in that section. The third-quarter earnings of Union Oil Co. and Standard Oil Co. of California were less than the same period in 1934 due to this development although for the nine-month periods their net earnings were substantially greater than in 1934.

In the remainder of the United States the earning statements reflect the improved operating conditions for a majority of the companies. Prices on refinery products have averaged higher than last year, particularly in the Mid-Continent, and there has been less price cutting in retail gasoline and other consumer markets. There is still need of higher refinery and consumer prices at many points to bring the proper balance for the refining and marketing divisions in relation to crude oil posted schedules. There has been progress in bringing about this correlation over the past few months which accounts for the improved earnings with additional favorable developments apparently assured for the remainder of the year.

The accompanying table shows total net income and earnings per common share for the first nine months of 1935 and 1934 and by quarters for the years 1934 and 1935 for representative companies:

Record levels of gasoline consumption and reduction of total stocks of crude and refined oils to the lowest point in over eight years combine to place the petroleum industry in a better statistical position than it has enjoyed for some time past, the Pforheimer company points out.

The report explains that the indicated domestic demand for motor fuel during the first eight months of 1935 according to figures compiled by the Bureau of Mines, totaled 283,644,000 bbls., establishing a new high record for any comparable period. This represents an increase of 5.4 per cent over the corresponding period of 1934 and 4.8 per cent above the first eight months of 1931, the previous peak year. That this improvement has been continued to date and that final figures for the current year will at least show a corresponding increase is indicated by forecasts of the Bureau of Mines which estimate domestic motor fuel demand for the months of September, October and November from 4 per cent to 10 per cent above the similar months of 1934; also, the fact that as the year progressed the rate of increase over last year became greater, amounting to 10 per cent in both July and August compared with an average increase of only 4 per cent in the first six months.

Stocks of all oils on September 1, 1935, aggregated 558,053,000 bbls. equivalent to approximately 172 days' supply and were at the lowest level for any time since May 1, 1927, when the total of 554,857,000 bbls. represented 226 days' supply. Since June 1, 1930, when the peak of 700,808,000 bbls. was reached, stocks have declined almost continuously and withdrawals from storage during this period totaled 142,755,000 bbls. This reduction in stocks despite the fact that total new supply of all oils has increased considerably in recent years reflect the better balance between supply and demand. Actually, total demand, including exports, has total supply, including imports, by a substantial margin in recent years.

The accompanying table shows total supply, total demand, and stocks of all oils and indicated domestic consumption of motor fuel during the first eight months of each year since 1928 (figures of the U. S. Bureau of Mines in barrels of 42 gallons).

Total Supply, Demand and Stocks

Eight months January-August	Indicated domestic motor fuel consumption	All oils			
		Total supply	Total demand	Stocks at end of period	Days' supply
1935	283,644,000	708,041,000	714,126,000	558,053,000	172
1934	269,184,000	666,702,000	678,642,000	590,258,000	203
1933	250,517,000	665,354,000	637,003,000	620,545,000	220
1932	250,387,000	617,899,000	627,658,000	622,139,000	243
1931	270,608,000	655,539,000	688,019,000	634,482,000	214
1930	264,829,000	728,396,000	731,062,000	686,831,000	223
1929	249,316,000	781,996,000	723,433,000	678,673,000	208
1928	215,516,000	679,780,000	660,595,000	616,328,000	209

L. E. BARROWS

L. E. Barrows, production division manager of The Texas Co. at Fort Worth, Tex., has been promoted to the position of manager of the production department of The Texas Co., and will make his headquarters in Houston, Tex. The change is effective December 1. Mr. Barrows will report in Houston to R. Ogarrio, vice president in charge of production of The Texas Corp. No announcement has yet been made as to a successor to Mr. Barrows in Fort Worth.

Net Income and Earnings Per Share

		Nine months		Third quarter		Second quarter		First quarter	
		Net income	Per share	Net income	Per share	Net income	Per share	Net income	Per share
Amerada Corp.	1935	$1,259,214	$1.60	$440,880	$0.56	$419,024	$0.53	$399,310	$0.51
	1934	1,446,114	1.87	424,657	0.54	496,458	0.65	524,999	0.68
Atlantic Refining	1935	1,880,500	0.71	1,625,122	0.61	384,696	0.14	d129,318	d0.05
	1934	5,374,700	2.02	2,384,113	0.89	2,377,587	0.89	613,000	0.23
Mid-Continent	1935	1,450,892	0.78	954,552	0.51	778,397	0.42	d273,057	d0.15
	1934	1,481,964	0.80	380,075	0.20	791,859	0.43	310,030	0.17
Phillips Petroleum	1935	9,850,427	2.37	4,820,462	1.16	3,477,640	0.84	1,542,325	0.37
	1934	4,208,706	1.01	1,698,549	0.41	1,784,032	0.43	726,125	0.17
Plymouth Oil	1935	537,242	0.51	205,395	0.20	146,014	0.14	185,833	0.18
	1934	543,235	0.52	151,959	0.15	180,962	0.18	210,314	0.21
Seaboard Oil	1935	1,222,652	0.98	374,661	0.30	408,814	0.33	439,177	0.35
	1934	1,071,498	0.86	328,703	0.26	374,576	0.30	368,219	0.30
Shell Union	1935	4,411,649	0.21	3,882,915	0.26	1,649,774	0.08	d1,121,040	d0 13
	1934	550,921	d0.09	1,488,704	0.07	d897,592	d0.11	d41,091	d0.05
Standard Oil Kansas	1935	39,657	0.27	24,347	0.16	d45,634	d0.31	60,944	0.42
	1934	308,628	2.09	76,869	0.52	100,150	0 68	131,609	0.89
Tide Water Associated	1935	5,829,227	0.53	2,461,784	0.27	2,146,462	0.21	1,220,991	0.05
	1934	4,582,669	0.31	1,904,284	0.17	1,247,422	0.06	1,430,963	0.08
Union Oil of California	1935	4,000,000	0 91	1,050,000	0.24	1,600,000	0.36	1,350,000	0.31
	1934	1,700,000	0.39	1,400,000	0.32	d200,000	d0.04	500,000	0.11
Continental Oil	1935	5,568,802	1.19	2,435,106	0.52	2,192,889	0.47	940,807	0.20
	1934	4,432,594	0.93	2,055,282	0.43	1,165,829	0.25	1,211,483	0 25
Standard Oil California	1935	15,759,001	1.20	5,175,859	0.39	5,692,120	0.43	4,891,022	0.37
	1934	13,246,442	1.01	5,915,608	0.45	4,017,243	0.31	3,323,591	0.25
Skelly Oil	1935	1,575,054	1.26	$37,953	0.73	439,584	0.34	297,517	0.20
	1934	593,473	0.25	361,154	0.25	378,974	0.26	d146,655	d0.26
Total	1935	$53,384,327		$24,290,026		$19,289,780		$9,804,521	
	1934	$39,550,044		$18,569,957		$11,817,500		$9,162,587	

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SINCLAIR-PRAIRIE OIL COMPANY'S GASOLINE PLANT no 18

COOPER-BESSEMER compressor units . . . to the tune of 3400 horsepower . . . make this plant near Gladewater, Texas an impressive example of efficient, low-cost performance.

This battery of twin units consists of eighteen Type-80's equipped with 8" and 16" compressor cylinders and two Type-80 auxiliary units. Hundreds of similar units have demonstrated their long life and reliability for many of the leading oil and gas companies.

Cooper-Bessemer's familiarity with economical gasoline-plant operation goes clear back to the pioneer days. Out of this long engineering experience, an advanced type unit—the Type-12—has now been developed. Ask about it.

N.B. Since the above was written 700 additional horsepower has been added to this station.

THE COOPER-BESSEMER CORPORATION

Mount Vernon, Ohio — PLANTS — Grove City, Pennsylvania

California Crude Oil Purchasers Meet Standard's Revision in Schedule

LOS ANGELES, Calif., Nov. 5.—All purchasing companies have now met the Standard of California advances in crude prices of November 1, Union Oil revising its schedule today.

The new prices represent increases in the Standard's former schedule ranging from 6 cents for the lower gravities to 30 cents for the higher gravities. On the average grade of refinable crude, Signal Hill 27-degree gravity, the advance is 30 cents—from 50 cents to 80 cents per barrel.

At the present time, the Standard company announced an increase of 3 cents in the price of third structure gasoline, and 3½ cents for regular and premium gasolines, in Southern California; and 1 cent on third structure gasoline, and 1½ cents for regular and premium gasolines, in Northern California, except at a few places where prices have not been on a normal basis. Prices in the Northwest remain unchanged. The greater advances in Southern California, compared to those in Northern California, again establish the normal relationship of prices in these localities.

Although the problem of overproduction of crude oil has not been solved, a Standard statement says, a great deal of effort has been made in that direction, and a high percentage of the producers in the State have indicated a desire to co-operate in balancing supply with the demand, and in the belief that this objective may be accomplished on a basis of better prices, the company's new schedule of prices was placed in effect. "At the same time it cannot be hoped to maintain crude oil prices unless prices for products derived from the crude oil support them. For that reason the company's selling prices for gasoline have been advanced to bring some balance and stability in what has been a very demoralized and unsound market. The stabilization of the oil business, California's major industry, is of the greatest importance to the prosperity of this State and to all business therein."

Total crude production during the early part of November is substantially in excess of the early part of October, indicating that the average daily production during November will be substantially in excess of October unless production in the Kettleman North Dome Field is severely restricted.

State officials have been endeavoring to have operators in the North Dome straighten out their differences, but as a result of the failure to agree on equitable allocations, stepped out and petitioned the Superior Court at Hanford to reinstate the action that was taken off the calendar last year. The State has asked that this case be put back on the calendar and the injunction modified to enjoin operators against unjustified and uneconomic production of natural gas in certain sections of the field.

Action against operators in the Mountain View Field is being held in abeyance pending the outcome of litigation involving operators in the Kettleman North Dome Field, but will be instituted upon conclusion of the latter case if a temporary injunction is secured.

Samedan Oil Corp. Completes 17,000-Bbl. Well in Hobbs

The Hobbs Pool, in Lea County, New Mexico, was featured in the past week by another big initial producer, Samedan Oil Co.'s No. 4 State C, located 1,315 feet from south and west lines of Section 24-18-37. The well flowed 17,107 bbls. of oil and 17,000,000 feet of gas from pay at 4,180-4,218 feet. It had been treated with 14,000 gallons of acid. The well was completed.

Two new operations were started in the pool, Shell Petroleum Corp.'s No. 1 State E, C E half SE SE Section 14-18-37, material being moved in, and Phillips Petroleum Co.'s No. 1 Land Office, C NE SW Section 19-19-37, rig up.

Jeffers Oil Corp.'s No. 1 Britt permit, 1,980 feet from N and W lines of Section 7-20-37, made a drill stem test at 3,793-3,881 feet and the well showed a production of 500 bbls. of oil and 5,000,000 feet of gas in 24 hours.

In the Eunice district there were three completions: Continental Oil Co.'s No. 3-A-18 Lockhart, C NE SW Section 18-21-36, flowed 1,896 bbls. naturally in 24 hours, with 1,500,000 feet of gas, from pay at 3,892-3,925 feet. Same company's No. 3-A-18 Meyer, C NE SE Section 18-21-36, was acidized with 3,000 gallons at 3,893-3,939 feet, and flowed 551 bbls. of oil and 900,000 feet of gas in 24 hours.

California Oil Co.'s No. 3 Meredith, C NE SE Section 19-21-36, was acidized with 3,000 gallons at 3,880-3,970 feet and later flowed 5,280 bbls. in 24 hours, with 132,000 feet of gas.

In the same pool, Getty Oil & Gas Co. has rig up for No. 1 State B, C NE NE Section 16-21-36. Shell Petroleum Corp. was building rig for No. 1 State-Endura, C NE NE Section 24-21-36.

In Quay County, the Danube Drilling Co. was running casing to 505 feet in a wildcat test, No. 1 Will Wallace, 250 feet from east and 2,490 feet from south lines of Section 12-9-32.

In Chaves County, John Tannehill's No. 1 Campbell, 330 feet from east and 1,630 feet from north lines of Section 1-11-25, was reported dry and abandoned at 1,301 feet.

New Taxes on Oil and Gas

AUSTIN, Tex., Nov. 6.—Senate State Affairs Committee Tuesday night approved the house omnibus tax bill on natural resources and occupation levies to pay the old-age pension, retaining a one-half cent per barrel tax on oil, a one-fourth cent increase on public utilities in cities of over 2,500 population, a 1 per cent levy on intrastate pipe lines, and a one-eighth cent per 1,000 feet tax on sweet gas. It eliminated sour gas and casinghead gas from the tax.

The Interstate Compact Commission will meet in Oklahoma City, December 13.

OBITUARY

JAMES A. FISHER, 65, of Wichita Falls, Tex., died November 4 after several months' illness. He moved to Wichita Falls in 1915 from Electra and was a member of the firm of Fisher & Gilliland, Inc.

J. K. CLARK, 38, president of the Houston Oil Field & Material Co. at Houston, Tex., died Monday at Baton Rouge, La., while on a business trip through Coastal Louisiana. Mr. Clark first went to Houston in 1924 as representative of the Baash-Ross Tool Co. He later became connected with the Houston Oil Field & Material Co. and had been president since January. He was also president of the C. M. P. Fishing Tool Corp.; president of the Ajax Tool Co., and vice president of the Oil Field Salvage Co., and Roxie Oil Co.

EDMUND BURKE

W. HOWARD PAPE

Two men widely known in the oil and gas industries have been advanced to higher posts with the appointment of Edmund Burke as manager of industrial sales for Crane Co., Chicago, and of W. Howard Pape to succeed him as director of sales to the oil and gas industries.

In his new position Mr. Burke will develop the industrial and construction markets for the use of valves, fittings and specialties. Prior to 1910, when Mr. Burke entered the service of Crane Co., much of his engineering experience was in the construction and operation of mechanical, electric and hydraulic plants. As sales engineer for Crane Co. he specialized in missionary and educational work among engineering and industrial organizations until 1913, when he was made manager of sales of specialties. In 1921 he was placed in charge of sales to the oil and gas industries.

Mr. Pape has been active in the oil and gas industries since 1914 in the capacity of designing, operating and sales engineer. On joining the Crane organization in 1927 he was made special representative in the New York territory and later the Boston territory. During the last six years Mr. Pape has been in charge of oil sales work in the Mid-Continent and Gulf Coast areas. His headquarters, hitherto in Tulsa, will be in Chicago.

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E D E L E A N U

Oil News from Foreign Lands

D. W. I.

Refinery operations of the Dutch West Indies, one of the largest suppliers of refinery products in the world markets, continue to expand, although only three plants are operating. The plants operating are those of Curacaosche Petroleum Industrie Maatschappij (Shell) on Curacao Island and Lago Oil & Transport Co. (Standard of New Jersey) each with a rated crude oil capacity around 165,000 bbls. daily and Arend Petroleum Co. (Canadian Eagle) with a capacity of 30,000 bbls. The latter two are located on Aruba Island.

For the first six months of this year a total of 57,261,000 bbls. of crude oil were imported from Venezuela to these refineries. For the same period in 1934 the imports were 50,337,000 bbls. of which 634,000 bbls. came from Colombia. These imports after subtracting exports indicate crude runs to stills of about 300,000 bbls. daily for the first half of this year, a gain of 38,000 bbls. daily over the same period in 1934. In addition 2,288,000 bbls. of fuel oil and 300,000 bbls. of gas oil were imported from Venezuela during the first six months of this year and about the same amount the first half of 1934. Some of these imports are further refined by cracking. At this time, additions amounting to approximately 17,000 bbls. daily of Dubbs cracking units are being built at Curacao refinery with smaller capacity being installed at the Arend refinery.

Following are the exports from these refineries for the first six months of 1935 and 1934 (data in barrels):

	1935	1934
Crude oil	3,587,000	3,892,000
Gasoline	13,907,000	12,152,000
Kerosene	1,301,000	1,511,000
Gas oil	3,124,000	3,578,000
Fuel oil	32,136,000	28,708,000
Lubricating oil	651,000	360,000

The following table of gasoline exports from the Dutch West Indies refineries for the same periods shows the widely scattered sales distribution of the three plants:

	1935	1934
United Kingdom	10,105,000	8,691,000
Netherlands	1,574,000	2,230,000
Norway	81,000	272,000
Belgium	164,000	263,000
Italy	317,000	255,000
United States	108,000	201,000
Sweden	417,000	163,000
Egypt	62,000	120,000
France	.....	108,000
Germany	.....	104,000
Denmark	.....	89,000
Finland	136,000	80,000
Union of South Africa	31,000	63,000
Portugal	31,000	61,000
Irish Free State	62,000	61,000
Argentina	67,000	55,000
Brazil	342,000	.....
Others	358,000	236,000
Total	13,907,000	12,152,000

The fuel oil and gas oil is sold in a larger number of countries than is gasoline.

SOUTH AFRICA

The refining plant of the South African Torbanite Mining & Refining Co., Ltd., located at Durban, South Africa, is now operating with crude oil. The plant will be operated with crude oil until other phases of its operations are completed. It will eventually operate with oil obtained from torbanite. It was recently announced that two retorts for treating 150 tons of torbanite daily are being constructed and will be in operation early in 1936. The assay plant has been completed.

The distillation unit which is now operating with crude can be used for the oil obtained from the retort operation. It has a crude oil capacity of 1,000 bbls. daily. The operations of the company are being watched with considerable interest in South Africa. If the operation proves a commercial success it will solve the problem of local supplies for that part of South Africa.

IRAQ

An official report shows that crude oil production of Iraq the first eight months of this year averaged 290,000 tons monthly. Calculated on a basis of 7.2 bbls. per ton, the average daily production was 70,000 bbls. The production varied widely, the extremes being 214,276 tons in January and 354,965 tons in July. The production in recent months based on the official reports has been less than commonly reported. It has been assumed that the production was running around 85,000 bbls. daily, the maximum capacity of the pipe line of the Iraq Petroleum Co., Ltd., which delivers the crude oil from the Kirkuk Field to the terminals at Haifa and Tripoli on the Mediterranean.

The pipe line deliveries so far this year have been about equal to the crude oil production of the field, the total for the eight months being 2,275,791 tons which compares with a reported production of 2,316,954 tons for the same period. The following table gives the Iraq crude production and exports by months (data in tons):

	Production	Exports
January	214,276	185,266
February	236,178	270,661
March	324,950	254,824
April	287,403	302,309
May	295,329	321,136
June	289,354	290,768
July	354,965	314,270
August	314,494	336,555

The bulk of the crude so far is going to the French refineries of the four interests which own the Iraq Petroleum Co., Ltd. These are the Compagnie Francaise des Petroles and subsidiary units of the Anglo-Iranian Oil Co., Ltd., Royal Dutch-Shell and American interests consisting of the Standard Oil Co. (New Jersey) and Socony-Vacuum Oil Co., Inc.

Each of these interests own a little more than 25 per cent of the stock of the Iraq company. Their refineries in France and other French plants absorbed 1,756,000 tons of the Iraq production the first eight months. Other exports of the Iraq crude were: United Kingdom, 354,435 tons; Canary Island, 79,470 tons; Italy, 62,154 tons and Belgium 23,713 tons. It is understood that shipments over the remainder of the year will probably represent the present capacity of the pipe line.

AUSTRALIA

Australia is gradually becoming an important consumer of petroleum products with steady gains in the demand for the principal products. Available data for 1935 which are not complete indicate that consumption is running ahead of last year with the probability that the entire year will show the largest demand in the history of that country. It is also increasing in importance as a refining center although approximately 80 per cent of the products consumed in that country are imported in the form of finished products.

So far no crude oil production of commercial importance has been discovered so that the country is almost entirely dependent on outside sources.

According to International Petroleum Trade of the U. S. Department of Commerce, imports of crude oil and refinery products, including shale spirits, totaled 8,830,000 bbls. in 1934, a gain of 30 per cent over the same period in 1933. The imports by countries divided as follows (data in barrels):

	1934	1933
PETROLEUM AND SHALE SPIRIT		
Netherland India	3,425,000	2,166,000
Iran (Persia)	221,000	158,000
United States	2,189,000	2,636,000
Rumania	141,000	207,000
British Borneo	43,000	118,000
Total	6,019,000	5,285,000
CRUDE PETROLEUM		
Iran (Persia)	570,000	.....
Netherland	1,062,000	.....
LUBRICATING OIL		
United Kingdom	6,000	8,000
Belgium	1,000	1,000
Germany	11,000	10,000
Mexico	1,000	1,000
Rumania	3,000	4,000
Netherland India	1,000	1,000
United States	307,000	337,000
Total	330,000	362,000
POWER KEROSENE		
British Borneo	8,000	33,000
Netherland India	221,000	218,000
Iran (Persia)	19,000	12,000
United States	147,000	213,000
Rumania	7,000	6,000
Total	402,000	482,000
KEROSENE, ETC.		
Netherland India	209,000	151,000
United States	217,000	307,000
Iran (Persia)	18,000	1,000
British Borneo	3,000	12,000
Rumania	.....	1,000
Total	447,000	472,000

The two principal refineries operating in Australia are owned by Commonwealth Oil Refineries, Inc., and the Shell interests. The former is owned eually by the Australian government and the Anglo-Iranian Oil Co., Ltd. The latter furnishes the crude oil for the refinery from its fields in Iran at the rate of approximately 1,500 bbls. daily. The Shell refinery, which is about twice as large, obtains its crude from the relatively near fields of Netherland Indian.

In the importation of finished products approximately 44 per cent comes from the Shell and Standard-Vacuum refineries in Netherland India, followed closely by United States. It will be noted in the table that practically all of the lubricants imported into Australia come from the United States. The latter last year was also the principal supplier of kerosene.

Tank trucks of oil company in Iran crossing a stream while hauling gasoline to Teheran

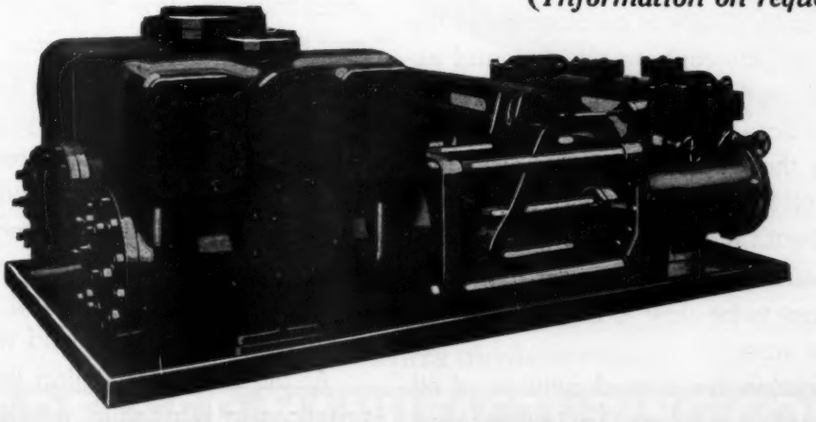
The temperature of the fluid pumped is immaterial

The new TRANSIT Heavy Duty Block Valve Pump was designed to handle either hot or cold liquids or semi-liquids around refineries. The material pumped is introduced and expelled from the pump through large direct fluid passages that cannot trap air, and through special design valves now made larger than ever.

This pump can be operated so hot that the fluid end will glow on a dark night, and so cold that frost will form on the fluid end. No trouble will be experienced from loose valve stems, loose valve guards, or loose separate valve seats, because such things are not part of this pump.

Pumping hot tar around 700 degrees Fahrenheit is hard on rod packing. So the stuffing boxes are made deeper to lessen wear on the packing and rods. Tie-bar construction renders the stuffing boxes easier of access, thereby inviting more frequent and accurate adjustment.

(Information on request)



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PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by

THE PETROLEUM PUBLISHING COMPANY

114-16 West Second Street, Tulsa, Oklahoma

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Making Sure of It

The general good feeling generated by the improved statistical position of the oil industry continues to be taken calmly. There is an absence of the customary "rarin' to go" atmosphere which found expression at the first rift in the clouds in premature anticipations of an immediate advance in prices.

That is one thing the depression has taught the world—caution. A shell-shocked world that had felt its props giving way beneath it, a world that was beginning to doubt the possibility of security ever rising out of such instability, is apt to be slow to believe in good fortune. It wants to be sure.

That, perhaps, explains the altered attitude of oil men to an improvement in conditions that in times past would have been hailed with jubilation. Yes, they say, conditions are better but let us do what we can to have them stay better.

The first touch of wintry weather is a reminder that the growth in consumption of gasoline which has been a main factor in improving the statistical position of the industry cannot continue at the same rate in the next few months. The industry can get along through the winter strengthening its position rather than weakening it by attempting to forestall the expected expansion of business in the spring.

This conviction is deeply felt by many who fear that a material upward revision of the crude price before conditions actually require it might upset the balance which is being attained. Some further strengthening of the refined schedule would provide a firmer foundation and pave the way for better crude prices.

Reports that refiners have been loading up with crude suggests the danger of increased runs to stills upsetting the refined market. It would be deplorable if, after restraining their activity early in the year, they were now to offset that by overproduction.

If they direct their efforts to sustaining and strengthening the refined structure there cannot fail to be compensation in the spring for their patience.

President's Policy

The statement read before the convention of the Independent Petroleum Association of America as having been approved by President Roosevelt is interesting as indicating the present attitude of the administration towards the oil industry. The difference in tone contrasted with the utterances of the petroleum administration a year ago is marked.

Recognition of the efforts of the constructive elements in the industry is gracious and deserved. Announcement that the Government has no desire to make a public utility of the industry is to that extent reassuring in view of previous statements by the former petroleum administrator.

The industry has shown that it is as anxious as the President to secure orderly development and a distribution and marketing plan that "will stabilize the industry and assure a reasonable profit at all times."

Effective regulation will require more than the stop-gap methods forced by unprepared-for emergency. It will include consideration of more scientific methods of producing fields to avoid waste.

At the Institute meeting the proposed code of fair practices in marketing which has been submitted to the industry for discussion will be further considered. The formulation of such a code acceptable to the bulk of the industry is an essential step toward the elimination of abuses which have repeatedly disrupted the market. The statement from President Roosevelt should have weight in furthering agreement on this point.

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STYLE 38 Steel Couplings make PERMANENTLY TIGHT, flexible connections between plain-end pipe sections, are quickly and easily installed by unskilled labor, are rubber gasketed, and absorb all normal pipe movements. Sizes: ½" I.D. to largest pipe diameter for all kinds of pipe.

STYLE 40 Long Sleeves serve the same purpose as Style 38's, but are installed on widely separated pipe ends. Sizes: ½" I.D. to 24" O.D. inclusive.

STYLE 53 Cast Couplings are like Style 38, except cast. Sizes: 4" to 30" inclusive.

STYLE 65 Compression Couplings have screw followers instead of bolts to compress the gaskets. Sizes: ¾" I.D. to 2" I.D. incl.

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Dresser Clamps repair leaks in various types of pipe joints. They can be applied by unskilled labor without interruption of the service, give a permanently tight repair and are made by the world's largest and oldest builder of clamps.

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STYLE 55 Porous Weld Clamps permanently repair porous but not broken welds. Sizes: 2" O.D. to 26" O.D. inclusive.

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Dresser Split Sleeves completely enclose and permanently repair breaks, splits, holes and defective joints of all types. They can be applied quickly, by unskilled labor, in any weather, under water, etc. All are rubber packed. Special styles of welded steel sleeves are built for unusual conditions or odd sizes.

STYLE 52-A Sleeves repair welds, screw collars, splits, holes, etc. Inside length: 8". Maximum working pressure: 500 lbs. per sq. in. Sizes: 4" I.D. to 26" O.D. inclusive.

Style 73 Sleeves are used for the same purpose as Style 52-A, except maximum working pressure is 250 lbs. per sq. in. Inside length: 8". Sizes: 2" I.D. to 12" I.D. inclusive.

STYLE 26 Sleeves repair broken bells on cast iron pipe. Maximum working pressure: 150 lbs. per sq. in. Sizes: 3" to 24" inclusive.

Style 57 Sleeves are identical with Style 73, except made for cast iron pipe sizes. Maximum working pressure: 250 lbs. per sq. in. Sizes: 3" to 12" inclusive.

Multiple Installations of two or more Style 57 or 73 Split Sleeves, for repairs longer than 8", can be made with simple joiner parts.

Style 54-A Sleeves repair leaking joints of the bolted coupling type on steel pipe. Maximum working pressure: 500 lbs. per sq. in. Sizes: 2" I.D. to 26" O.D. inclusive.

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New TVP Control Unit Uses Tubular Heater Instead of Original "Stoves"

By NEIL WILLIAMS

For the past four months, TVP Corp. has had in operation at Texas City, Tex., a 5-bbl. daily capacity, vapor phase cracking process control unit. A complete plant, identical in every essential detail, except size, to a commercial installation, the unit has been duplicating every processing condition of a large plant. It has been engaged in making test runs of various charging stocks ranging from naphthas down to heavy reduced crudes.

Every known means for raising the antiknock value of motor fuels has been scrutinized by refiners and substantial progress has come about in cracking as a result. In the accompanying article the operation of a semi-commercial vapor phase cracking unit is briefly described, the unit including several unique features when compared with similar commercial installations. The operating data presented here are considered representative of commercial scale operations in as much as the plant was designed as a control unit.

Results of the runs have proved the process capable of handling charging stocks of a wide range of boiling points without sacrificing yields or the high octane rating of the finished gasoline. With recoveries up to 85 per cent, a product of 70 to 80 octane number (motor method), or 80 to 95 octane number (research method), is being obtained from most charging stocks.

The blending value of the gasoline is high. From East Texas stocks, blending values up to 96 octane, M.M., have been obtained. On selected stock higher blending values are obtainable.

The finished product from all stocks is sweet, of good odor, noncorrosive, and has an induction period ranging between 50 and 150 mg. per 100 cc.

Typical of the operation are the following results, the first table being based on a charge of Greta crude and the second table on a run of heavy reduced stocks from East Texas crude. In reference to Table 1, the most interesting feature is that the entire crude remaining after topping the 15.9 per cent straightrun was charged direct to the unit, reforming and cracking it in a single operation.

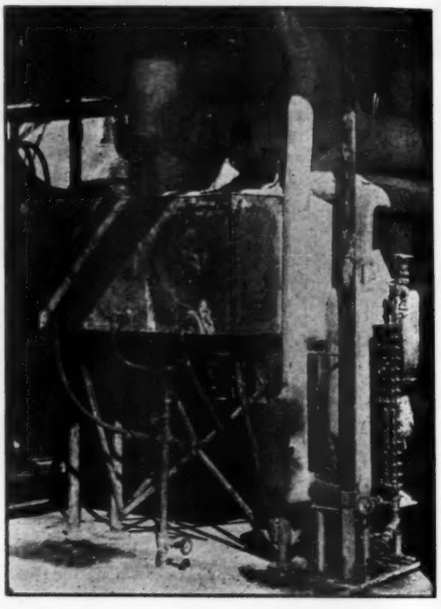
Like the commercial sized plant, of which it is a replica, the second unit is capable of processing a variety of charging stocks, reforming, cracking and polymerizing them in a single operation. Polymerization takes place simultaneously with the cracking, which accounts for the high yields of high octane number gasoline. As yet there has been no coking at any stage of the operation, which probably is due to the absolute control of temperature and pressure conditions at all critical points.

Major elements of the process consist of a furnace, flash drum, reaction chamber, scrubber, fractionator, and suitable exchangers and condensers. An important development in the control unit is the provision of a tubular heater for the cycle gas to replace the "stoves" used in the original plant design. This change permits a higher degree of efficiency at a lower capital cost. As designed in the small unit, the cycle gas heater, vaporizer, and superheater coils are incorporated in a single furnace. The coils, consisting of one-half inch seamless steel pipe for the cycle gas and the superheater, and one-four inch seamless pipe for the vaporizer, are wound around 6-inch (O.D.), 4½-inch (I.D.) carborundum tubes extending the length of the furnace. There is a spacing of three-quarters of an inch between the surface of the carborundum tubes and the coils so that the coils are heated entirely by convection and not by direct contact with the hot tubes through which the heat is injected. The heating of each unit is controlled separately. In a commercial plant, a conventional pipe still can be used.

To produce heating conditions duplicating those of a large plant, the furnace of the control unit is fired with gas instead of electricity, which generally is used in such plants.

In the process, the charge, consisting of fresh stock and recycle, preheated in heat exchange with vapors and hot gases off the scrubber, is raised to vaporization temperature in the vaporizer, which discharges into the flash drum. In normal operation a temperature of between 800° and 825° is maintained, although this varies according to the type of charging stocks. Vapors from the flash drum pass through the superheater coil, where the temperature is raised to about 1,000°, and thence into the reaction chamber. A small amount of cycle gas from the cycle gas heater feed line is by-passed into the vapor line from the flash drum to temper the vapors before entering the superheater, the vapors entering the latter around 850°.

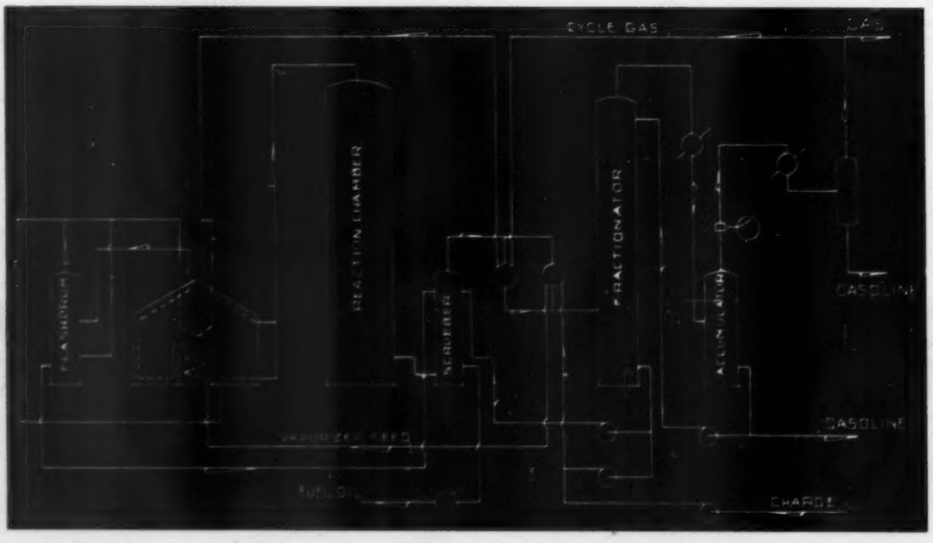
Sufficient heated cycle gas from the outlet line of the cycle gas heater is by-passed into the flash drum to aid in vaporization and to keep the vapors as dry as possible. The volume of this by-passed cycle gas can be regulated to any desired extent. The hot cycle gas also may be passed with the heated vapors from the vaporizer through the superheater, or in part with the superheater vapors to the raction chamber.



Gas heated furnace and tubular still

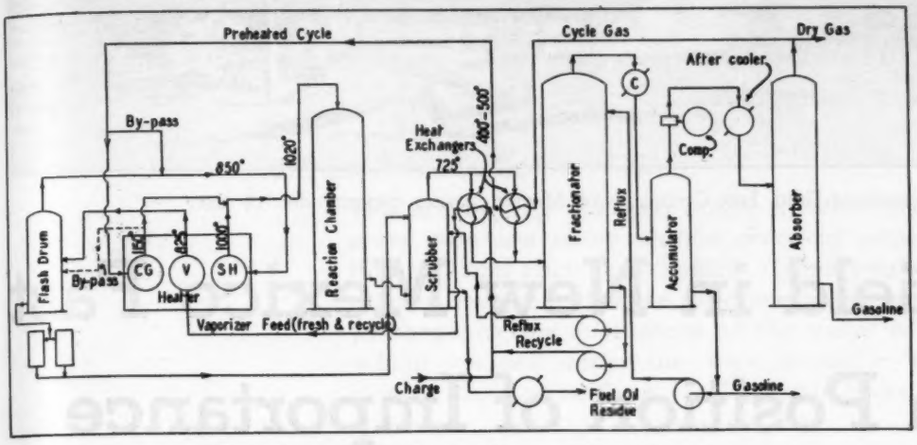
The superheated vapors, coming off around 1,000° and blended with the hot cycle gas coming off around 1,150°, enter the reaction chamber in average operation around 1,020°. The raction chamber of the control unit is a vertical cylinder, 19 inches in diameter and 5 feet 8 inches in height. The time element in this step of the process is approximately two minutes.

From the reaction chamber, the vapors, at a temperature around 920 degrees, enter the scrubber, which, in this unit, is constructed of 10-inch pipe, having four rectifying trays with standard 4-inch bubble caps. Bottoms from the flash drum also are charged into the scrubber, entering near the top. The hot vapors from the reaction chamber, entering near the bottom and ascending counter-current to the flash drum bottoms, serve as a stripping medium for



Flow chart for TVP vapor phase commercial installation

the latter. So effective, however, is the vaporization in the flash drum, the blow-down seldom runs more than 10 per cent of the vaporized feed into the drum. This blow-down usually is around 16 degrees A.P.I. gravity.



Flow diagram for Texas City experimental unit

In this particular installation, the flash drum bottoms flow by gravity into two measuring tanks, calibrated into quarter gallons and used alternatively to measure the blow-down into the scrubber. In a commercial plant these tanks probably would be eliminated and the blow-down passed into the scrubber by the vapor pressure in the flash drum.

A representative distillation run of the unstabilized cracked gasoline, which in this case was from a mixture of East Texas reduced stocks, follows:

	(° F.)
Gravity, deg. A.P.I.	47.1
Sulfur, per cent	.05
I.B.P.	89
10 per cent	155
20 per cent	206
30 per cent	250
40 per cent	290
50 per cent	320
60 per cent	344
70 per cent	366
80 per cent	386
90 per cent	405
E.P.	426

TABLE 1—OPERATING DATA BASED ON GRETA CRUDE AS CHARGING STOCK

	Yield based on crude, %
Charge:	
35.3 A.P.I., 17% @ 300° F., 32% @ 400° F.	
Straightrun Gasoline:	
64.4 A.P.I., 280° F. E.P., 60 Octane No. MM...	15.90
Cracked Gasoline:	
52.0 A.P.I., 407° F. E.P., 9 lbs. Reid V.P., 73.5 Octane No. MM.	59.10
Total Gasoline:	
53.4 A.P.I., 405° F. E.P., 72.5 Octane No. MM.	75.00
Residue:	
9.4 A.P.I., 0.3% B.S.&W., 122 Furol Vis. @ 122° F.	11.60
Gas and loss	13.40

TABLE 2—OPERATING DATA BASED ON HEAVY RESIDUUM MADE FROM EAST TEXAS AND COASTAL CRUDE

	Yield based on crude, %
Charge:	
22.3 A.P.I., 418° F., I.B.P. 10% @ 495° F., 50% @ 622° F.	
Cracked Gasoline:	
47.1 A.P.I., 427° F., E.P. 10 lbs. Reid V.P., 77 Octane No. MM.	47.6
Residue:	
7.1 A.P.I., 0.6% B.S.&W., Vis. 43 secs. Say. Furol @ 122° F., pourpoint 0° F.	42.4
Gas and loss	10.0

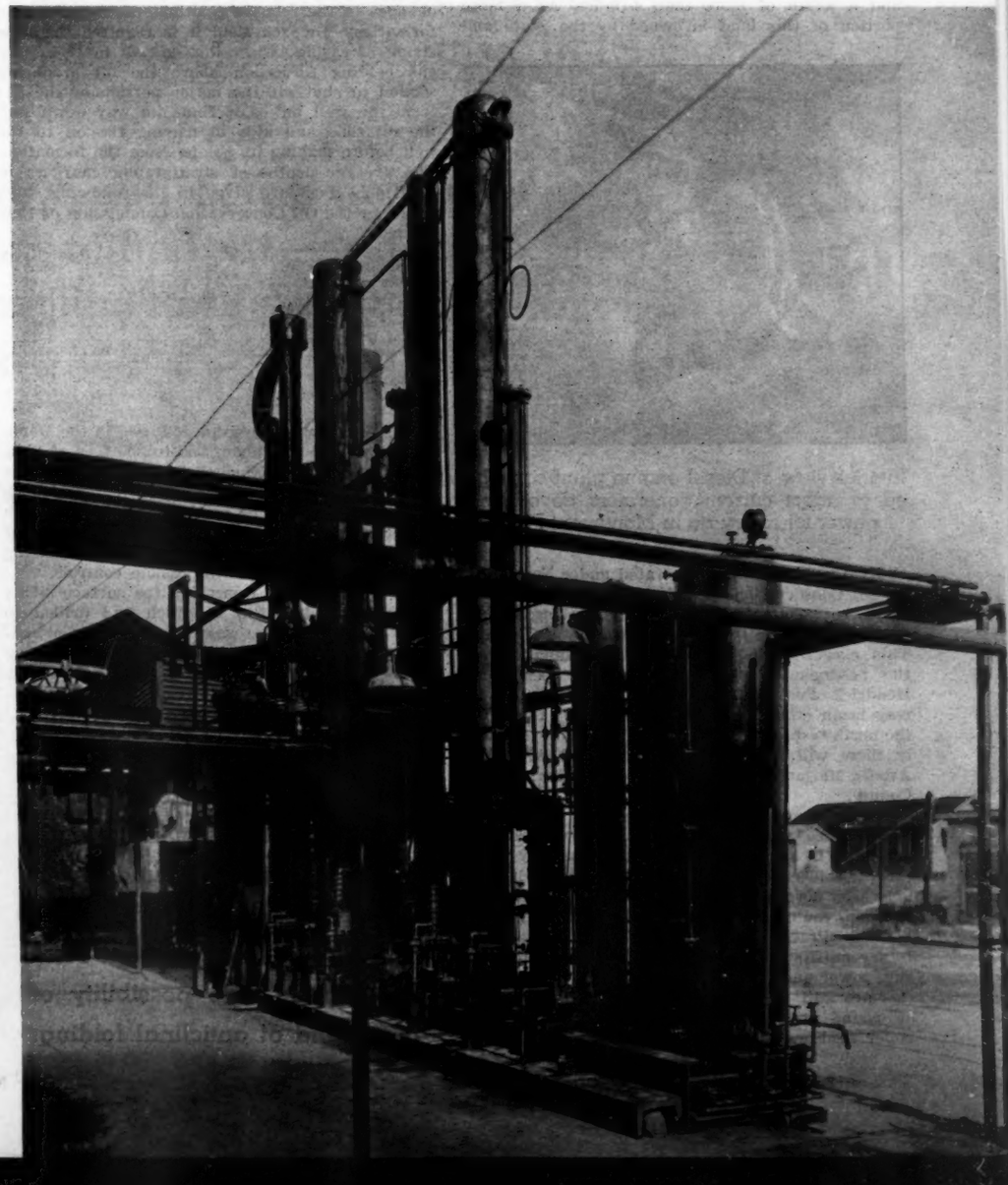
Vapors from the scrubber pass overhead, through heat exchangers, to the fractionator. In the heat exchangers, the hot vapors and gases from the scrubber, leaving the latter around 725 degrees, are used to preheat both the charge to the vaporizor and the cold cycle gas to the cycle gas heater. In this step the temperature of the vapors and gases drops to around 550 degrees.

In the scrubber, any tar from the flash drum blow-down is separated and becomes a part of the fuel residue which is drawn off the bottom. This has a very low Furol viscosity at 122°. Some has had a gravity as low as minus 1.2 degrees with a pour test of 30 to 35 degrees.

The fractionator is equipped with four stripping trays on bottom and 16 trays on top. Bottoms constitute recycle stock. A small amount is diverted to the top of the scrubber as reflux. The vapor and gases pass overhead from the fractionator, through a condenser, into the accumulator. Temperature at the top is controlled by gasoline reflux from the bottoms of the accumulator. Normally, a temperature of 320° is maintained for 400 endpoint gasoline.

The gasoline bottoms of the accumulator represent on the average around 75 per cent of the total distillation. The wet gas from the top of the accumulator goes to the recycle gas compressor, through an after-cooler, and thence to the cycle gas heater. The small amount of "make" gas enters an absorber, where it is stripped of its gasoline content. For absorption oil, gas oil is used and when this is not adequate the heavy gasoline is supplied.

General view of TVP Corp. vapor phase cracking process control unit at Texas City

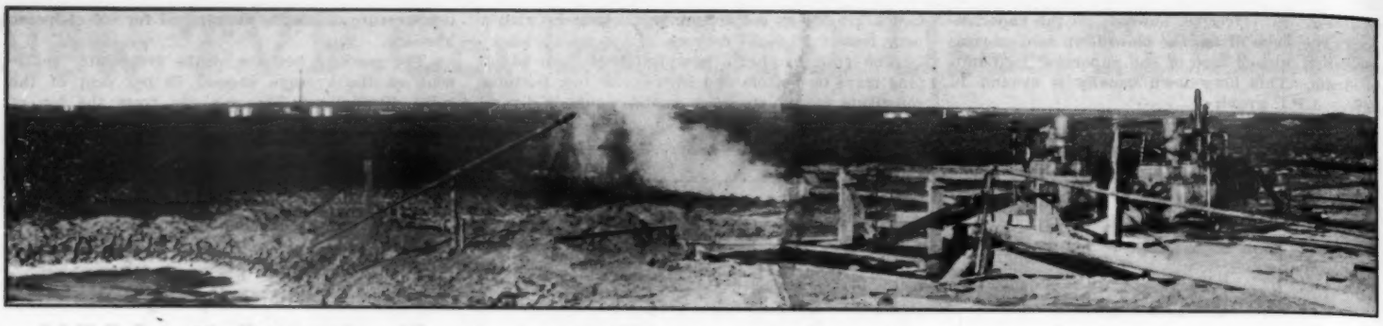


Test of Various Spray Oils and Illuminants Before A.S.T.M.

Two new subcommittees are being organized, one on plant spray oils which will standardize various tests for these products, and the second on illuminating oils to which has been assigned the task of modifying the present burning test methods for illuminating oils.

The subcommittee on corrosion tests for lubricating oils has developed a co-operative test program using a testing machine in which oil is held at a predetermined temperature and pumped in small streams on bearings of various compositions. An attempt will be made to find test conditions which will yield results that may be correlated with performance in service in automobile engines.

The subcommittee on grease plans to develop a method for the determination of the dropping point of grease. Based on co-operative tests, it has been decided to submit the method using a spiral of copper wire, to the committee members for criticism. Consideration is also being given to a modification of the present penetration method for soft greases.

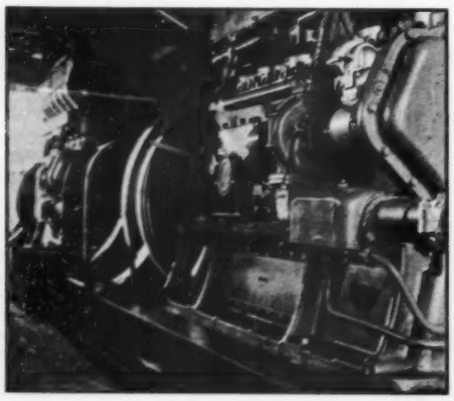


View of a portion of the Monument Field, Lea County, New Mexico, giving general idea of area

Monument Field in New Mexico Fast Assuming a Position of Importance

By L. G. E. BIGNELL

With the completion of Amerada Petroleum Corp.'s State D. 1 well in the new Monument Pool in Lea County, New Mexico, on March 2, 1935, another important field was added to the Permian Basin region. Since the discovery well was completed the field has been outlined for a distance of about 6 miles northwest-southeast and a width of more than 4 miles. As a large portion of this land is owned by the State and



Interior view of Diesel engine plant connected to direct current generators developing power for rotary rig in Monument Field

Federal government and operated under New Mexico Oil Conservation Commission rules and regulations the Monument Field has been classified as being of the same type as Jal, Cooper and Eunice. This classification indicates the continuation of the producing formations originally opened in Hendrick Pool, Winkler County, Texas, and it may mean other limestone fields will be found to the northwest of the Monument Field and eventually there will be connection established with the Artesia-Maljamar trend of pools in northern Eddy County.

Developments in the southeastern corner of New Mexico, which is Lea County, is very active and work in all pools is being pushed rapidly with the possible exception of Hobbs Field which has long been developed to a very considerable degree, although the complete area of the field is still undefined. Practically all wells are drilled with rotary outfits and use of internal combustion engine power units is making progress although most rigs are still powered with three 125-horsepower, 250-pound pressure steam boilers. Securing good boiler feed water is a problem in some areas of New Mexico but it is not usually the determining factor in deciding upon type of power to be selected for the rigs.

Discussing the present activity in Monument Field will, in a general way, give information regarding the drilling practice followed in the other New Mexico fields. Variations are due mostly to changes in the relative positions of the producing formations. In each field it is required the flow string of casing be set low enough in the upper gas bearing formation above the oil producing section to shut off the major portion of the gas from the well unless it finds its way down into the oil zone and aids in moving the oil to the well before making its escape from the formation. The average depths of stratigraphic markers in the Hobbs Pool are given in the following table issued by the Oil Conservation Commission of New Mexico:

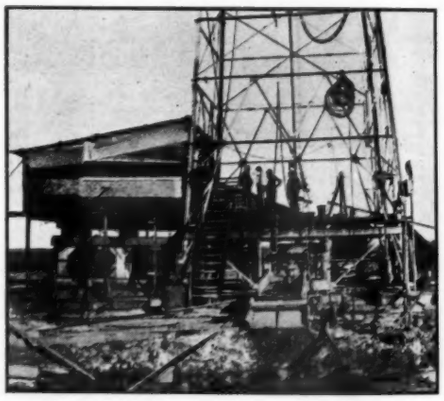
Formation—	Depth Hobbs (feet)
Potable water	90
Top of anhydrite	1,550
Top of salt	1,700
Base of salt	2,800
Top of brown lime	2,775
"Bowers" sand	3,200
"Big Gas" sand	3,700
"Sandy Dolomite"	3,975
"White Crystaline Lime"	4,025

The usual casing program followed in the Monument Field is to set about 250 to 300 feet of 12½-inch casing in the 15-inch hole and cement to the bottom of the cellar. The cellars are 10 feet deep and 10 feet square and cribbed with 3 by 12-inch lumber. One runway is provided and the master gate and blow-out preventers on the 9⅝-inch string of casing are provided with remote controls.

After setting and cementing the surface string the hole is reduced to 11¼-inch and drilled to either the top of the salt or through the salt. There are two methods followed in penetrating the salt beds which are about 1,000 feet thick in the Monument Field. A string of casing may be set in the top of the main salt below the Rustler formation and cemented to the surface or with 150 per cent of the calculated amount of cement required to fill back of the casing to the cellar or the 9⅝-inch string may be set in the Rustler anhydrite.

Scattered development in the Monument area in Lea County, New Mexico, indicates a field of major importance is in the making. Production is found in formations similar to those in other fields in southeastern New Mexico and indicate possibility of new trend of anticlinal folding.

The problem confronting the operators in these fields is to get a good cementing job behind the



Heavy rotary rig mounted upon steel substructure. Mud screen shown in front

string of casing penetrating the salt beds. If one string of casing is set above the salt it can be cemented satisfactorily and then the hole reduced to 9-inch and drilled through the salt using a 5 per cent Aquagel or Baroco mixture which has a tendency to form a coating over the salt. If natural mud is used without the Aquagel the rate of dissolving the salt will diminish as the water in the mud becomes saturated with the salt.

Muds used in Eunice and Monument Fields is now largely made from a clay mined in the Monument Field which has good mud properties.

The muds usually weigh about 11 pounds per gallon but muds weighing from 14 to 15 pounds per gallon can be made from the Monument clay but such muds are very thick and difficult to pump. In starting the wells from 25 to 30 tons of native clay is mixed in the pits and used in drilling the 15-inch hole for the surface pipe. Below this string the formations penetrated have good mud qualities and it is only necessary to add baroid, aquagel or other admixtures to secure desired mud characteristics for the particular section being penetrated.

When the 9⅝-inch string is set above the salt

A Gasoline Marketer Writes:

We are buying our anti-knock gasoline from refineries who are using Dubbs cracking process We find this fuel very satisfactory Have you any information available that we may use in our advertising to convince our customers of the value of this fuel which we sell under our own brand? —TONY'S GAS HOUSE, MCALESTER, OKLA, JAY J BASOLO, MANAGER

Tell them the truth, Mr. Basolo, and here is the truth:

Dubbscracked gasoline gives more miles per gallon than ordinary gasoline —and without knocking—because it IS Dubbscracked

That story will bring motorists into your stations to find out—and the Dubbscracked gasoline itself will keep bringing them back

AND THIS STORY IS JUST AS IMPORTANT TO YOU AS IT IS TO MR. BASOLO

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
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and cemented with about 600 sacks of cement the hole is reduced to 8¾-inch and drilled through the salt beds, the Brown lime and "Bowers" sand to a casing point within the "Big Gas" sand. In Eunice this string is usually about 3,800 feet long, in Monument between 3,700 and 3,750 feet long and in Hobbs from 3,900 to 4,100 feet in length. These variations in the length of the flow string set in the 8¾-inch hole are due to the various depth at which the gas formation is found and the penetration necessary to be made into it to permit the flow string to be set low enough to case off the upper part of this gas pay.

When the flow string is ready to cement it is usual practice to use the multi-stage method and place the sliding sleeve in the string so it will come opposite the anhydrite formation above the salt beds so part of the cement will be placed at least 200 feet above the casing shoe. In the upper portion of the hole the cement shall be placed behind the casing from a point just below the Rustler anhydrite formation to the surface using 150 per cent of the calculated amount needed for this purpose. Mud shall be circulated ahead of the cement.

If desired the operator may cement the intermediate string of casing with at least 150 per cent of the amount calculated to bring the cement from the bottom to the base of the salt instead of using the multi-stage job as outlined above.

It is required the production string be set either on the top or within the producing zone. It may be perforated if necessary. If the intermediate string of casing is set at the top of the salt, the production string shall be cemented with 150 per cent of the amount of cement calculated to bring the cement to the base of the salt. Mud shall be circulated ahead of the cement.

If the intermediate string of casing is set through the salt, the production string of casing must be cemented with 150 per cent of the amount calculated to bring it to the bottom of the next larger intermediate string.

It is required the surface casing be tested after drilling the cement plug and bailing the hole dry. The hole must remain dry for one hour to constitute satisfactory proof of a water shutoff. The surface casing shall stand cemented at least 36 hours before drilling the plug.

After the intermediate string is cemented it must stand at least 72 hours before testing pipe and cement job. The test will constitute in building up a pressure of 1,200 pounds inside the casing then closing valves and allowing well to stand 30 minutes, during which time the pressure must not drop more than 120 pounds per square inch if the test is to be passed as satisfactory. This test must be made before and after drilling the cement plug.

It is also necessary to make a like test on the producing string after it has been set and cemented. All fittings are put in place at the well head on the flow string and a pressure of 1,200 pounds built up inside the pipe both before and after the plug is drilled. It is usual practice to use the drawworks on the rotary rig to bail down the hole, but some operators move in a chain-driven sand reel for handling the bailer.

There is one distinctive feature of well completion in the New Mexico fields. The productive formation is of lime and experience has shown this porous zone to be charged with gas in the upper portion, with the oil below the gas and water beneath the oil. There is no direct division between these various zones but if the flow string is set low enough in the upper section of the lime pay, a large portion of the gas will be cut off from entering the well.

To determine where the casing should be set it is usual practice to drill the 8¾-inch hole into a gray lime shell at about 3,700 feet depth in the Monument Field and there to reduce the hole and drill ahead with a 6¾-inch bit. Where the hole is reduced from 8¾ to 6¾-inch size a shoulder is created and this provides an excellent place for setting the packer for the testing device. This

View under derrick floor showing connections on 9⅝-inch string of casing

tester is run on the drill stem and after the packer is set the valve is opened and the formation allowed to produce through the drill stem.

In the New Mexico fields the drill stem tests indicate the volume of gas present in the portion of the formation penetrated. If it appears the hole has not penetrated the full section of the gas zone the hole is deepened and one or two more tests made until the operator is certain the proper casing point has been determined.

When the casing point has been decided upon the 6¾-inch hole is reamed to 8¾-inch diameter and the casing run and cemented. It is usual practice to leave a portion of the lower section of the gas zone open into the hole and after the cement has set a 6¾-inch hole is drilled out of the bottom of the flow string of casing to a depth of from 50 to 80 feet to penetrate the oil-saturated limestone.

Many operators now require the contractor to complete the wells using the pressure control method and use crude oil for drilling fluid. Other operators prefer to complete the wells using mud because they object to having the cuttings from the pay zone contaminated with the crude oil used for drilling in when the pressure control system is used.

Where the pressure control method is used samples are taken every 2 feet of hole made. The oil and gas separator used with the pressure control system is of the low pressure type rated for 125-pound working pressure. The top of the casing below the master gate is connected with the separator by a 4-inch pipe. Oil and cuttings flow freely into the separator, the oil passing on to the circulation tank connected with the pumps used to force the oil into the well through the drill stem, and the cuttings settling into the bottom of the trap to be drawn off as the trap fills.

The samples of cuttings are taken from a section of 4-inch pipe either welded into the 4-inch flow line between casinghead and trap or attached to a 4-inch T screwed into this line. The sampler is from 12 to 18 inches long and provided with gate valves at the upper and lower ends.

The operators who prefer to drill in in the usual manner use mud screens and find it possible to secure very good samples of the formations from these screens. It is usual to delegate this duty to a geologist or an engineer who takes the samples in a prescribed manner at regular intervals.

After the producing horizon has been penetrated it is usual practice in the New Mexico fields to give notice to the Oil Conservation Commission of intention to shoot or acidize the well. As these wells all produce from the lime, acidizing is usually practiced. For all flowing wells it is necessary to run a string of tubing not to exceed 3-inch diameter and this tubing is used for placing the acid.

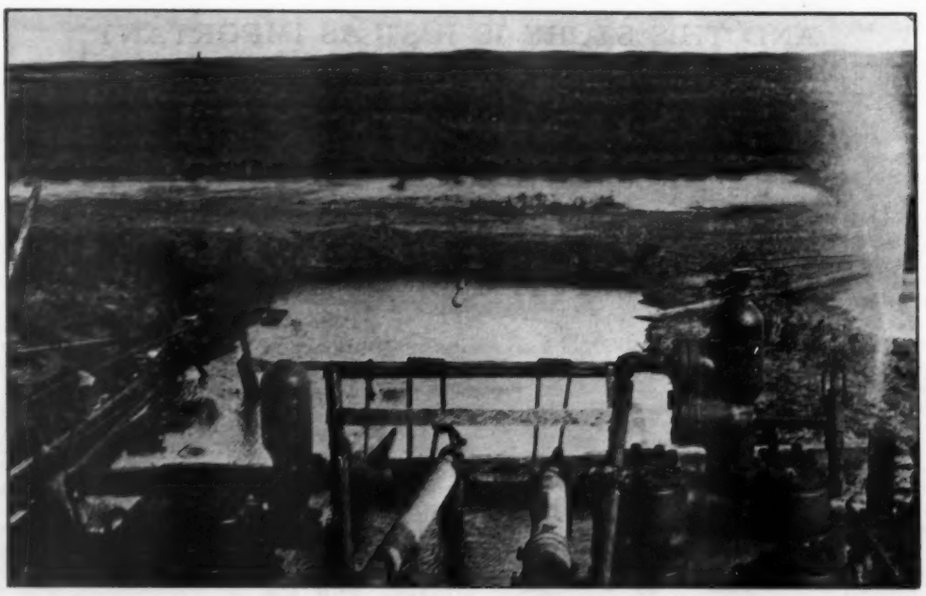
The tubing is usually run with a wall packer in the Hobbs Field but in the other pools the use of the packer is not universal practice. Where packers are used care must be taken not to destroy the seat with acid. Precaution must also be taken not to destroy the fabric used in making the packer. The tubing is usually run by employing a snubbing in method, for the wells are usually under pressure when the time comes to run the tubing.

The equipment used in drilling wells in the Monument Field consist of a 122-foot heavy rotary type steel derrick, usually mounted upon a steel substructure from 6 to 7 feet high. Two 7½"x 14½"x20" stroke steam slush pumps are used at each well. The slush pits are usually two in number, each 18 feet wide by 50 feet long and from 3 to 4 feet deep and dug parallel and about 10 feet apart. Across the end of the two circulating pits a reserve pit 50 to 60 feet long is dug.

One 12"x12" steam engine is used to drive the drawworks. Usually three 125-horsepower, 350-pound working pressure boilers are set up at each well to furnish steam. Gas is used for fuel and water is secured either from a water company operating in the Eunice and Monument Fields and distributing water through a pipe line system or from individual wells drilled near the oil well.

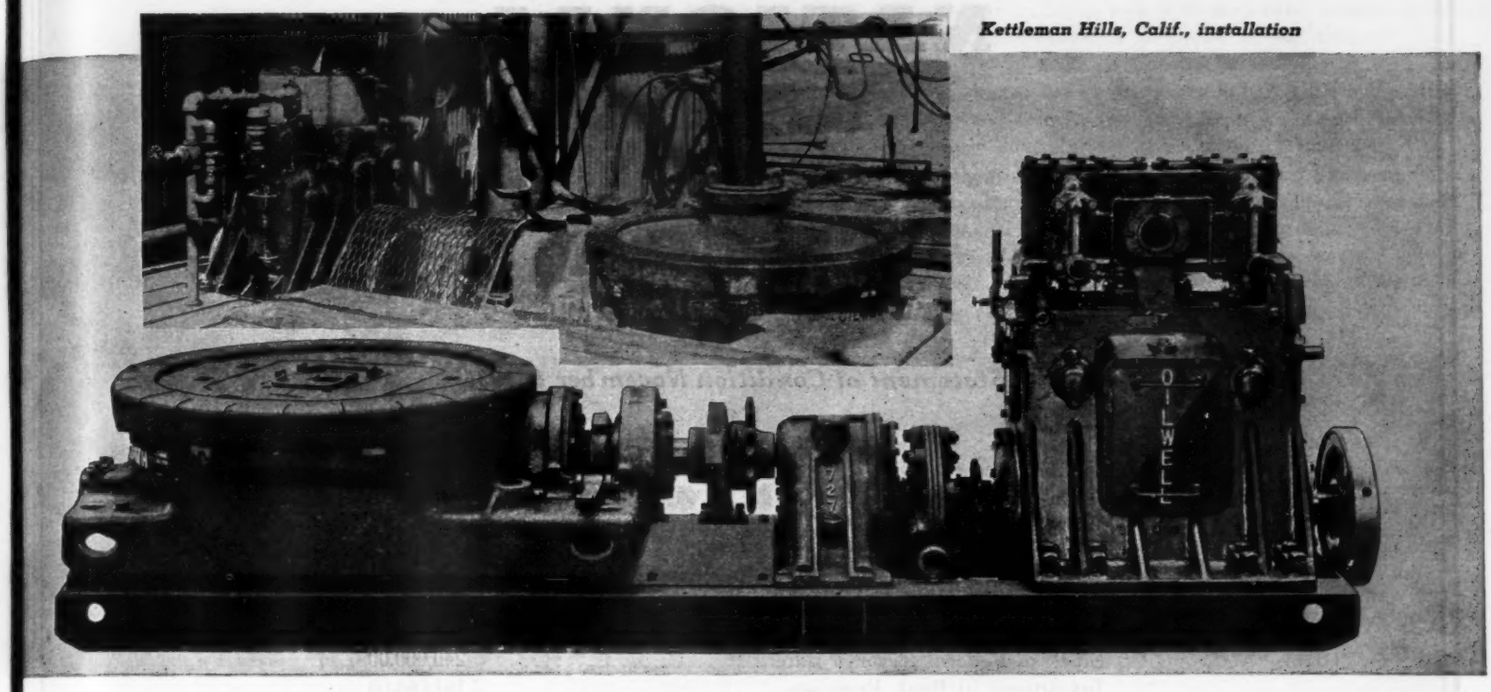
In the Jal and Cooper Fields several companies have their own water systems and one company has four water wells for drilling and domestic purposes in the Monument Field.

It is usual practice to complete No. 1 well on each lease in such a manner as to permit gas to be produced between the flow string and the intermediate string of casing and bradenheaded so the gas may be piped to other locations to be used as fuel. Gas for this purpose is usually secured from the "Bowers" sand, for this is sweet gas, whereas the gas produced from the lower gas zone is usually contaminated with sulfur compounds. This lower gas may be used to assist in producing the oil.



Typical mud pits and pumps used in the Lea County oil fields where water is scarce

A REVOLUTION IN ROTARY DRILLING



Kettleman Hills, Calif., installation

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for the first time in the history of rotary drilling

★ **Uses 10%-15% Less Steam and Fuel**
★ **Eliminates Chain-Sprocket Drive**
★ **Makes "Spudding" Easier**
★ **Permits "Drilling Up"**

"OILWELL" Nos. 726 and 727 Drilling Units

These new Units consist of the 26" Model 34 Make-and-Break Rotary and 27½" Model 35 Straight Rotary, respectively, direct-driven through gear box by the "OILWELL" No. 7 (7¾" x 7") Vertical Twin-Cylinder Piston Valve Steam Engine, with rotary, engine and gear box mounted integral on skids for Convenience and Portability. Ask for Bulletin No. 145, describing new Units.

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The "OILWELL" *No. 7 Steam Engine is also used to direct-drive Power Slush Pumps.*

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TULSA, OKLAHOMA

Statement of Condition November 1, 1935

RESOURCES

Cash and Due from Banks	$ 19,424,751.20	
U. S. Government Securities	12,804,256.11	
Other Bonds and Warrants	3,406,625.15	35,635,632.46
Loans and Discounts		14,882,532.80
Overdrafts		2,950.55
Income Receivable Accrued		123,508.44
Stock in Federal Reserve Bank		240,000.00
Investment in Bank Premises		2,161,000.00
Customers' Liability under Acceptances		6,927.50
TOTAL		$53,052,551.75

LIABILITIES

Deposits		$44,524,493.43
Acceptances Executed		6,927.50
Income Collected not Earned		52,974.71
Interest, Taxes, etc., Accrued		165,375.97
Capital—Preferred	$ 4,000,000.00	
Capital—Common	2,000,000.00	
Surplus	2,000,000.00	
Undivided Profits and Reserves	302,780.14	8,302,780.14
TOTAL		$53,052,551.75

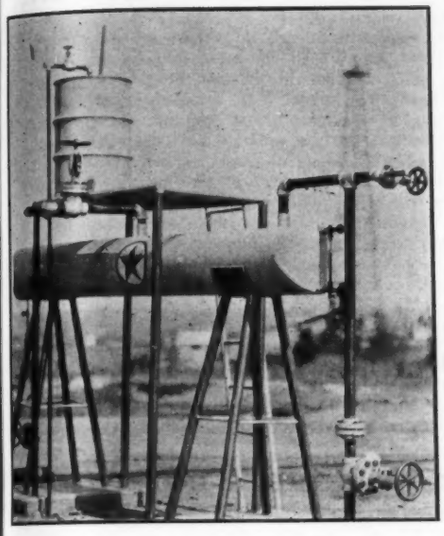
COMPARATIVE DEPOSITS

November 1, 1933	$ 26,852,913.00
November 1, 1934	35,651,882.76
November 1, 1935	44,524,493.43

The Oil Bank of America

OPERATING IDEAS

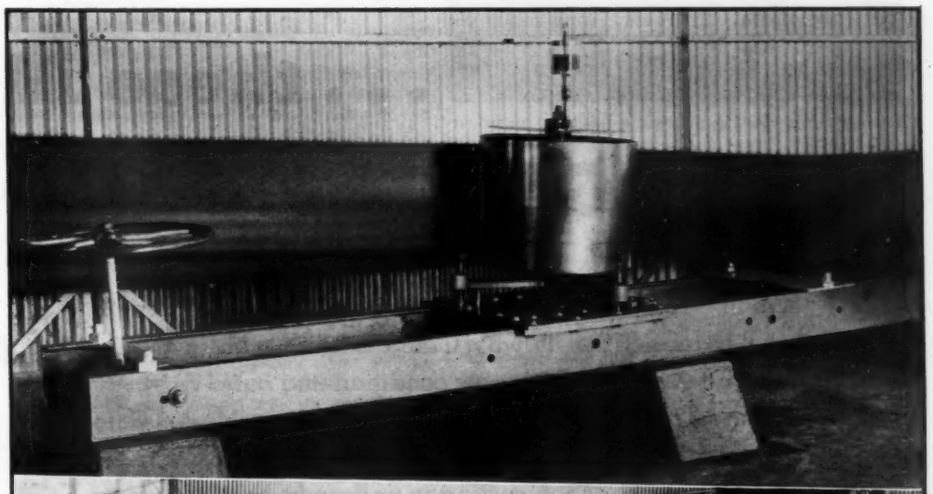
Chemical Lubricator

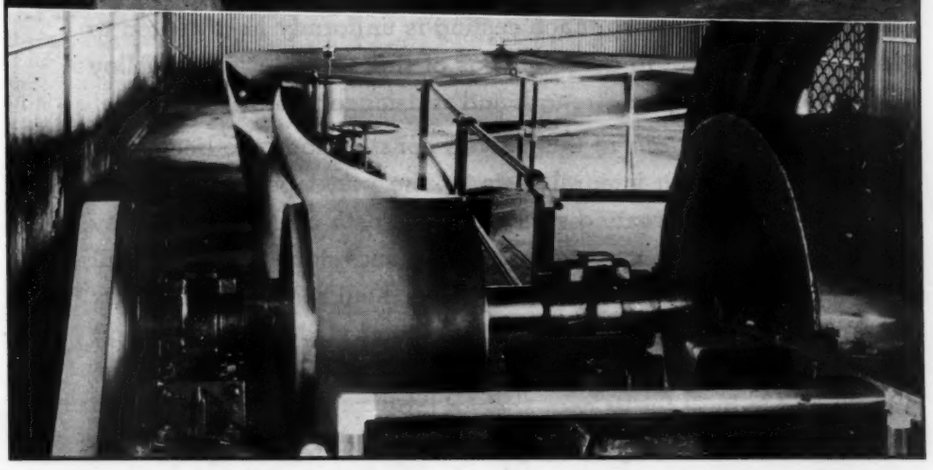


Efficiency, convenience, safety and appearance feature a treating chemical lubricator being used by one of the large operators in the Mid-Continent. This lubricator, made in the field of good, scrap length casing, is designed and connected to withstand operating pressures as high as the test pressure of the casing used to make the lubricator body. The drum located on the platform, built of junk pipe, is used as a vat to mix the treating chemical, with either oil or water, to the desired percentage. Connections are made from the drum to the lubricator for dumping the mixed chemical into the lubricator. This line at the right of the lubricator is for balancing the pressure in the lubricator with that in the flow line to make gravity feeding of the treating chemical solution possible through the small line at the left end of the lubricator. This small line is equipped with a high pressure sight-feed glass and needle valve for adjusting the chemical flow.

Long Frame Idler Improves Life of Belt

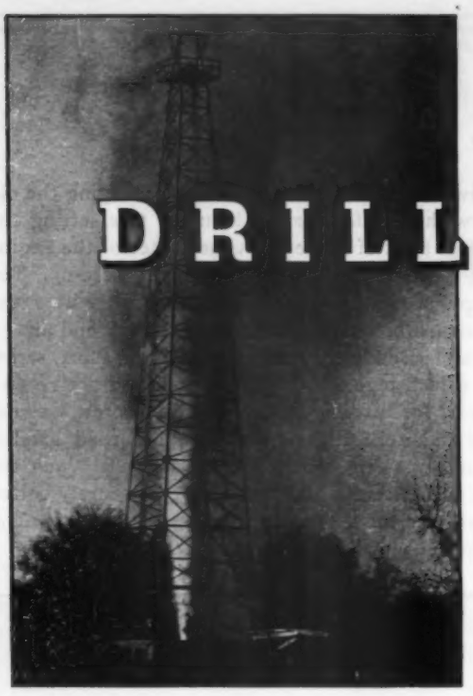
The following pictures show an inexpensive and rather novel method of changing the old short type belt idler to a parallel setting with a 14-foot track. In using this setting the forward end of the track is set about 2 feet back of a line from the center of the engine pulley and tangent to the bandwheel. This 14-foot track provides ample take-up. The idler frame shown in the upper photograph is made of 6-inch channel iron with cross members welded on the bottom and steel straps bolted across the top at each end and in the center. The idler pulley, pulley base, and screw were taken from the old short, screw type idler. Some operators have used junk 6-inch pipe for the idler track and are receiving satisfactory results. A novel arrangement for turning the idler take-up screw was devised for this particular job by using gears and a handwheel from an old road grader. This makes it more convenient for the pumper to tighten or loosen the belt. When the pulley has been moved forward the length of the screw, the pulley base is securely bolted to the track and the screw and handwheel are moved forward to a new position. The lower photograph shows a general view of the parallel setting.





Economical Door Stop

A novel door-stop being used by one of the large pipe line companies to hold swinging doors open is shown in the accompanying photograph. It is both convenient and inexpensive. It consists of a short piece of 2-inch pipe, securely anchored in the ground near the wall toward which the door swings, with a flat head welded to the pipe with a small, short bolt protruding through this head far enough to pass through the flat iron strip used as a revolving catch. This flat strip is about 1-1/2 inches wide and 10 inches in length with 2 inches of each end turned up at an angle of 90 degrees with the strip. Being pivoted at the center by the small bolt it swings easily in either direction. The accompanying cut shows two of these door stops, one holding a door and the other with the door close to it. As this door is swung completely open the edge of the door reaches past the center bolt about 1 inch, the edge of the door striking the end of the catch nearest the wall thereby swinging the catch around so that the other end is brought into a position in front of the door like that shown on the right.



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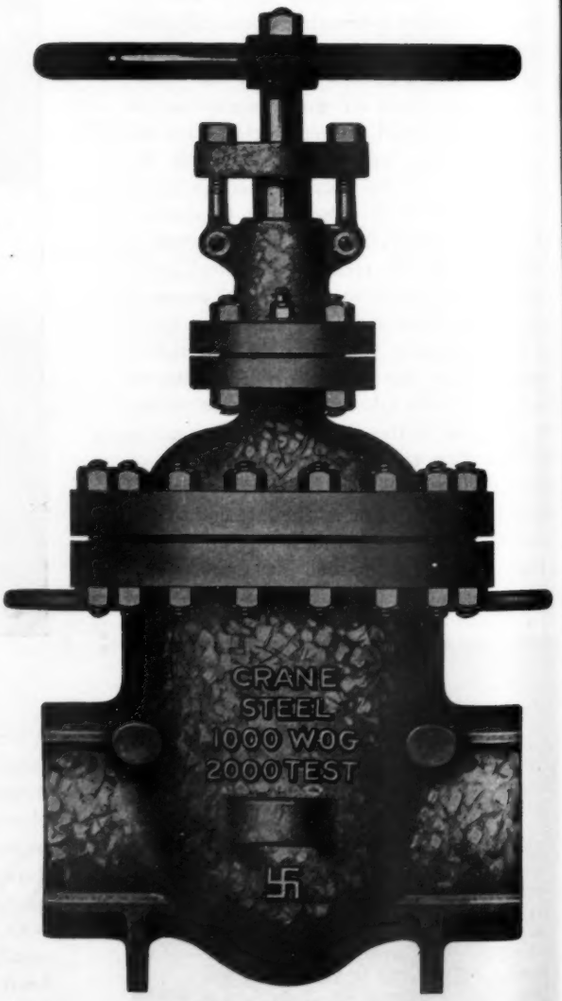

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TECHNICAL ABSTRACTS

Aluminum Stearate Lubricants

F. J. LICATA
Chemist, Metasap Chemical Company

Before Chicago meeting of Lubricating Grease Manufacturers Association

In the discussion of aluminum stearate greases, the advantages, general procedure used in the manufacture of aluminum stearate greases and factors affecting the quality of the product are reviewed. Advantages of this type of grease include high temperature resistance, stability, waterproofness and wide application. Consistency of aluminum greases depends on three factors, namely: quantity and quality of the stearate used; viscosity of the petroleum oil used; and rate of cooling of the hot greases discharged from the kettle. General rules that serve as adequate guides in the manufacture of this type of grease are stated. Oils from various sources and of different viscosities are used to show the effect of the petroleum oil on the consistency. Using an oil of uniform viscosity several greases are prepared to show the effect of: rate of cooling, moisture and time of compounding, and repeated working of this type of grease. In comparing the effect of petroleum oils, oils such as paraffin, naphthenic and asphaltic, four oils from each group having approximate viscosities are used to compound greases and A.S.T.M. penetrations taken. Greases made from paraffin oils show greater penetration or softness as the viscosity of the oil rises. Very little change in the greases made from asphalt oils is indicated from the penetration readings.

Ball-Bearing Lubrication

By C. R. AHLBERG
Chemist, Marlin-Rockwell Corporation.

Before Chicago meeting of Lubricating Grease Manufacturers Association.

An investigation of grease lubrication of ball bearings, together with the deterioration of greases, is presented by the author and also the opinions of lubricating engineers and chemists on the possible cause of the decomposition of ball-bearing greases. Outstanding physical characteristics of ball-bearing greases should be: Free and clean from all injurious foreign matter, abrasives and fillers of any kind; free from acid or corrosive matter; uniform consistency, consistency uniform from one lot to another; no free oil; minimum volume increase during service; low in water content; nonhygroscopic; nonseparating during standing or while in operation; and stable character. Routine inspection tests are given to determine the above characteristics. Theories used to explain the different stages in the decomposition are divided into three classes, namely: explanation of reaction causing decomposition of greases during storage; effects of bacteria, enzymes and oxygen; and hydrolysis of greases. The outstanding theories advanced in the first case are: that the problem is largely one of oxidation with the resulting formation of gummy products; that the reaction results in the production of organic acids of a corrosive nature, and a change in the state of dispersion of the soap in the grease; and grease in this condition favors oxidation due to the relatively large area exposed to the air and also because free fat present in the grease is subject to decomposition with a subsequent formation of free fatty acid. In the second case most theories state that oxygen is an important factor, and that while bacteria and enzymes might play an important role, the evidence is slight. With regard to hydrolysis, the general feeling is that it had but little significance as far as stability against decomposition is concerned.

Lubricating greases are primarily mixtures of materials which are not in a permanent state of equilibrium, therefore a small change one way or the other has a tendency to break up this equilibrium and cause failure in the grease is a statement made by the author in discussing the investigation of ball-bearing greases. The presence of free alkali, water, organic acidity, free fat, and various other inorganic salts are given as reasons for the decomposition of greases. Further discussing this subject the author states that decomposition of grease is materially reduced by using a stable mineral oil and a soap of good quality fat which has been properly blended, heated, cooled and mixed so that the most stable equilibrium of the emulsion is formed.

Grease Manufacturing Equipment

By F. E. HUGGINS, Jr.
Sowers Manufacturing Co.

Before Chicago meeting of Lubricating Grease Manufacturers Association.

Developments in the art of grease making as seen from the viewpoint of a grease equipment manufacturer are presented by the author. Beginning with the days when grease was made in small cauldrons, the stirring done by hand, he traced the development of manufacturing equipment to the present-day jacketed vessels equipped with mechanical stirrers and scrapers. Initial improvements in the stirring apparatus were revolving paddles attached to a vertical shaft, but since the material tended to go around the kettle in a mass with very little stirring action the second improvement was to add stationary arms between which the revolving paddles passed. The outstanding disadvantage of the latter improvement was that the material stuck to the walls and had to be removed by manual scraping, so that the next development was the addition of mechanical scrapers. The mechanical scrapers not only reduced the danger of making lump grease and decreased processing time but also gave a decided monetary saving.

Pressure saponification, the next step, was first used for making only soap or base under pressure but later improvements allowed the correct amount of oil to be charged along with the fat and alkali, thus making certain greases entirely under pressure. However, it took longer to make greases this way since the fat and alkali were diluted by the oil and also because the finished grease had to be cooled through a wider temperature range, whereas with a pressure mixer and open kettles the addition of the oil to the soap in the open kettle helped to cool the grease which it formed. Where the soap was manufactured separately under pressure, the correct amounts of fat, alkali, water and a little oil were charged into the mixer and an internal pressure of 50 to 85 pounds applied by turning steam at 100 to 150 pounds pressure into the jacket. After a period of 40 minutes to 2 hours, the time required for complete saponification, the soap was discharged into the open kettles where the oil was added to complete the grease making. Excess moisture contained in the soap was given off by the sudden drop in pressure or "flash-evaporation."

Methods of heating grease-making equipment includes steam-jacketed kettles, hot-oil jackets and gas-fired kettles. Methods of cooling the finished product vary according to the type of grease made. Some greases are poured directly into their packaging containers, others are cooled by circulating water through the steam jacket, while still others are cooling in shallow pans, in some cases shoveling it around from time to time in an endeavor to obtain even cooling. Aluminum greases are cooled in the same kettles in which they are made. The steam is turned off, the pressure released, and then the grease cooled by circulating water through the jacket. Positive scraping of the cooling surface also decreases the cooling time since grease is almost as good an insulator as asbestos.

Far from conventions

Practical Tests for Industrial Greases

By H. A. McCONVILLE
General Electric Co.

Before Chicago meeting of Lubricating Grease Manufacturers Association.

Simple and inexpensive tests that can be used by the average consumer to determine the suitability of a grease are presented by the author. A summary of the main desirable characteristics of a ball-bearing grease is given. To determine these points the author believes that the following tests should be made on ball-bearing greases and some of the tests on other greases; worked and unworked consistency, oil separation, free acid or alkali, flowpoint, moisture absorption, accelerated oxidation, dirt, practical test in motor, tests in B.E.C. machine, free fat, water and consistency at operating temperature.

Consistency is determined by the A.S.T.M. method and also free acid and alkali by A.S.T.M. tests. Dirt is determined by either of two methods. One method used is to transfer 10 cc. of grease to be tested to a clean milk-white titration plate and then after the grease and plate are covered with a sheet of cellophane the grease is worked out with a spatula to a uniform layer covering approximately 3 square inches. The number of particles of dirt visible in one square inch when viewed through a binocular microscope at ×12 magnification is recorded as the cleanness rating. The other method is a quantitative determination in which a weighed sample of grease is dissolved in toluol and filtered through filter paper, using a steam funnel. The dirt is then collected in a watch glass and weighed, more than a trace of dirt being cause for rejection.

The moisture absorption test is also described and from the results obtained on these tests the author concludes that a high rate of absorption might lead to other troubles such as causing the grease to become sticky and the formation of soluble volatile organic acids. The method of performing the accelerated oxygen test is discussed, this test being of particular interest since examination of oxidized greases show that oxidation in all cases is accompanied by an increase in acidity and sometimes by a drop in the flowpoint of the grease. The effects caused by water and free fat being present in a grease are stated and also results obtained from practical tests in a motor.

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PARTIAL VIEW OF MACHINE SHOP

Treating Crude Oil Emulsions in the Seminole Area Routine Operation

By HAROLD K. IHRIG

Treating crude oil emulsions in the Seminole, Oklahoma, area, is accomplished with a minimum of expense. Treating plants vary in size, capacity, efficiency and initial cost. Several methods of computing costs are being used. This article also discusses the vapor pressuring of stock tanks, the handling of tank bottoms and the various kinds of treating equipment used in that field.

Treating crude oil emulsions in the Seminole area is being accomplished with minimum expense with reference to the consumption of chemicals, loss of oil, maintenance and labor. The method of treating is almost standard with all companies except for several minor details of construction and operation of plants and quantity of supervision given to this particular phase of the production of oil.

The characteristics of the different emulsions

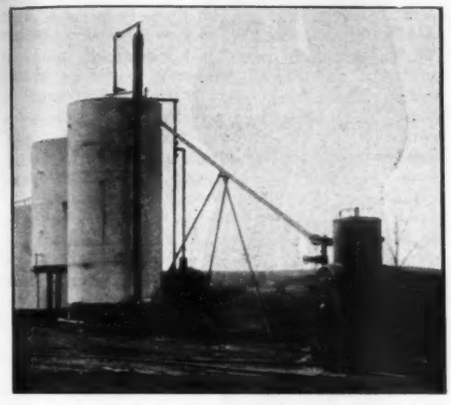


Fig. 1—Boiler type heater in treating plant in St. Louis Pool in Oklahoma

common in the Seminole area vary with the specific gravity of the oil, the specific gravity of the salt water being produced with the oil, the percentage of emulsification, consistency and stability of the emulsion. The emulsions encountered in this field are the water-in-oil type, with the percentage and stability of the emulsion varying from well to well, depending upon several factors used in current production practices.

It is well known that the formation of emulsions is much facilitated by the presence of gas, air, slippage of fluid past worn cups, plungers or liners, worn or leaky balls and seats, leaky tubing or any small orifice through which the oil and water may have opportunity to pass under the high hydrostatic pressure built up by a 4,000-foot fluid column. The formation of these emulsions can be largely prevented by the proper attention to the mechanical details of pumping and handling the produced fluid. Pumping conditions which permit free gas to be drawn into the pump are avoided as much as possible in wells that "pump off," or from which the fluid is pumped at a faster rate than it enters the hole, as this condition permits the pump to only partially fill with fluid and sets up a "churning" action with each stroke of the plunger which will emulsify the oil and water in the pump. The more of this churning the fluid receives the "tighter" and more stable the emulsion becomes.

Microscopic studies have shown that in permanently emulsified oil the water is present as minute globules ranging in diameter from .004 to 1.0 mm. The small globules of water appear to be encased in a film of oil, the average distance between water globules in permanent emulsions being less than one-half their diameter.

According to Uren, the water drops present in a petroleum emulsion are usually negatively charged, the absorbed ionic charge on the dispersed fluid is in part responsible for the formation of emulsions, through reduction of surface tension. Whether or not this is true is difficult to prove, but there is no doubt but that the electric charge contributes to the stability of emulsions. Petroleum emulsions respond to treatment with various chemical reagents, which operate either to dissolve the films enclosing the water globules by direct solvent action, or by neutralizing the negatively charged water globules.

The emulsions produced in the Seminole area vary in character and range in color from light brown to nearly black. A noticeable characteristic is their high viscosity.

The average treating plant in the Seminole area consists of the following major units:

1. Heater.
   (a) Thermostatically controlled.
2. Wash tank.
   (a) Boot or flume.
3. Settling tank.

Heat may be applied for treating by several different methods. The most common type of heater is that converted from an old steam boiler. The usual practice in using this type of heater is to weld a collar to the underside of the barrel of the boiler about 1 foot in front of the rear flue sheet to be used for connecting the intake line, and to weld another collar in the top of the dome of the boiler as the discharge connection. Fluid pumped from the wells is put into the boiler at the bottom of the barrel and in traveling through the boiler must pass upward around the flues and forward to the dome to be discharged. This action not only allows time for heating but offers sufficient opportunity for agitation that is essential in thoroughly mixing the treating chemical with the emulsion.

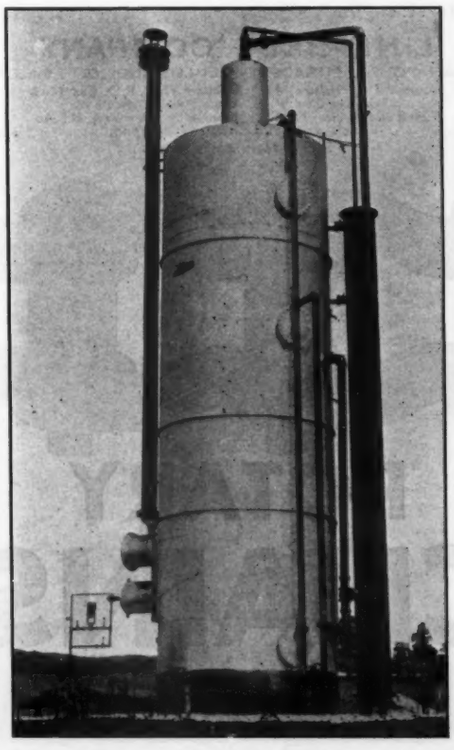


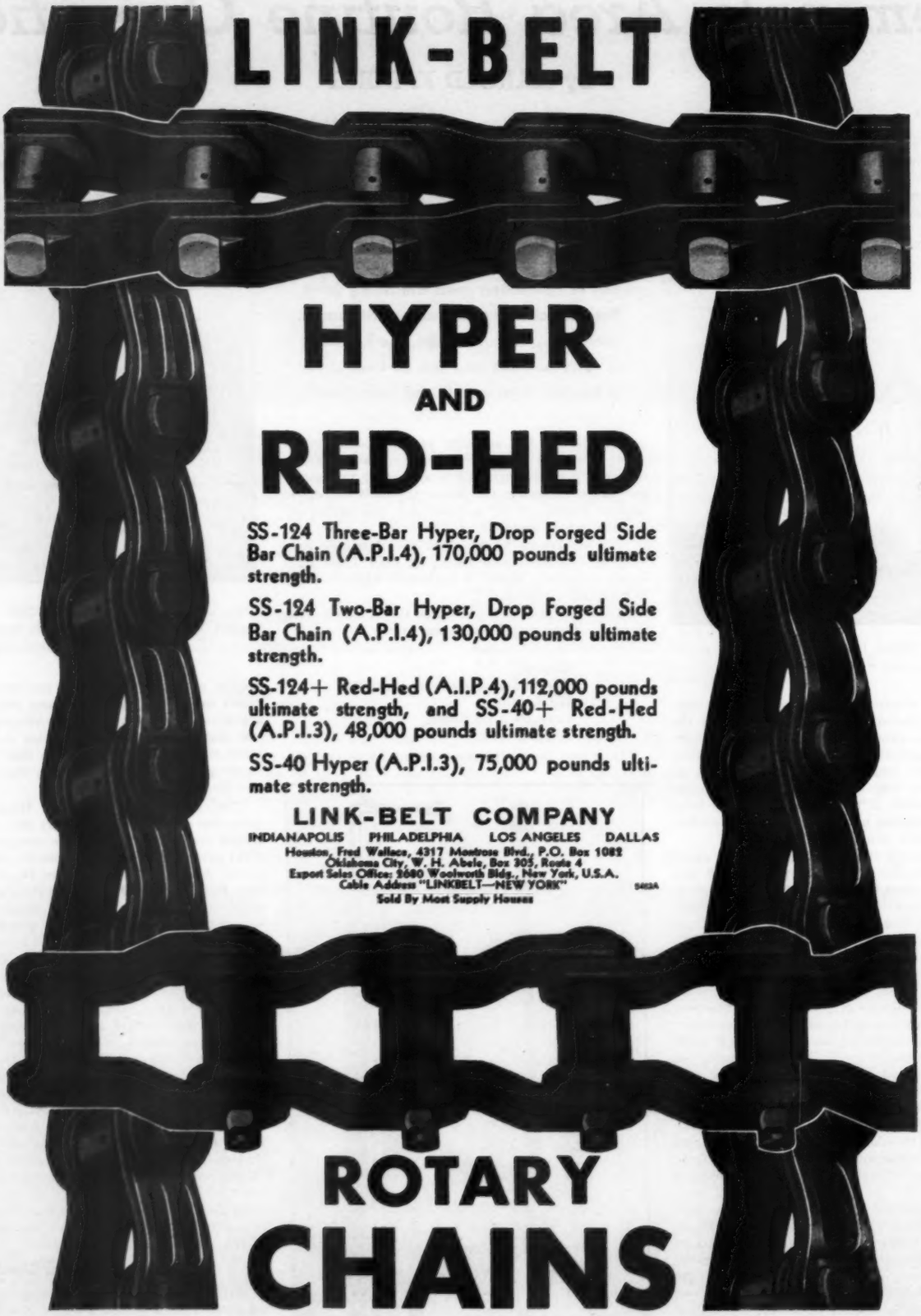
Fig. 3—New type heating, treating separator being used in Seminole area

Fig. 2—Thermo-syphon water heater with wood vapor-pressure wash tank, Seminole Pool, of Greater Seminole area

The method of connecting these units varies from one company to the next but the results obtained are comparable. Some companies pump the fluid produced from the wells through the heater to the wash tank, as shown in Figure 1, and from that tank it flows by gravity through the settling tank to the stock tanks. A method of treating used by other companies is to pump the fluid directly into the wash tank, and a heater used which keeps the water in the wash tank hot by thermo-syphon action. A unit of this type is shown in Figure 2. The heater in this case is the barrel of an oil field type steam boiler that has been cut from the fire box of the boiler and a steel plate with a door welded on where the barrel had joined the original fire box. Connections from the bottom of the wash tank are led into the bottom of the heater and the discharge of the heater is connected to the wash tank at approximately the water-oil level. Upon heating the water naturally rises and in so doing is discharged into the tank and is replaced in the heater by water from the bottom of the wash tank. This cycle may be speeded or retarded by adjusting the quantity of fuel supplied to the heater. In most installations the fire is controlled by a thermostat placed in the body of the heater.

Steam Heaters Used

Still another method of applying heat to the emulsified oil is by using steam coils in the bottom of the wash tank. These coils, usually made of 2-inch pipe, are built in a flat spiral about the center of the tank and 1 foot off the bottom of the tank. Steam is put into this coil from a lease boiler and the rate of travel of the steam through the coil is adjusted at the exhaust side of the coil to the point that will keep the fluid in the tank at



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the desired temperature. Heating treating tanks by this method is not a very common practice because of expense incurred in firing a steam boiler.

Wash tanks in the Seminole area vary greatly as to size, material and source. There are a great many of the following size tanks being used as wash tanks, namely 210-bbl. steel welded, 315-bbl. steel welded, high 500-bbl. bolted steel, 1,000-bbl. bolted steel, and 500-bbl. and 750-bbl. wood vapor pressure tanks, with the late appearance of several patented heating, treating separators that are designed to replace, as a single unit, an entire treating plant of the older type. A tank of this type is shown in Figure 3.

The wash tanks are all equipped with a conventional gas separating flume, or "boot," either outside or inside the tank, into which the oil is discharged from the boiler heater (see Figure 1), and the gas given opportunity to separate from the oil and enter the tank from the top while the fluid goes down the boot and enters the tank about 1 foot from the bottom into what is known as a "spreader." This spreader is made in the form of a cross and is nearly as long as the diameter of the tank. A series of small holes are drilled or cut into the under side of this spreader so that the fluid, in being discharged from the spreader, will be broken up into a series of small streams, so that in rising through the 6 to 10 feet of water in the wash tank the emulsion will be evenly distributed over the area of the tank and all the emulsion thoroughly heated to the necessary temperature to secure a "break." The oil in traveling upward through the water becomes heated, and with the attendant reduction in viscosity rises faster than the emulsion. Thus the emulsion is exposed to contact with the water and the proper conditions are present for coalescence of the globules of water in the emulsion with the water in the tank.

Pressure Proof Syphon

The water maintained in the wash tank is usually about two-thirds of the total fluid in the tank with the fluid level being from 1 to 2 feet from the top chime of the tank. The free water coming into the tank with the oil and that from the emulsion are discharged from the tank by the use of a siphon discharge which is set so that the water level in the tank remains fairly constant. In using the ordinary siphon, very little if any pressure can be held on the tank and still maintain the constant water level. It is highly desirable to keep from 2 to 16 ounces pressure on the tank in order to keep a maximum amount of gas in solution in the oil in an effort to keep the gravity of the oil as high as possible. To accomplish this a rather unique siphon has been developed that will operate very efficiently against these low pressures and also against a slight vacuum without any variance of the water level in the tank. One of these siphons is shown in Figure 4. This photograph also shows the gauge glasses on the side of the wash tank.

Settling tanks are used in such cases that the oil coming from the wash tanks carry a small percentage of free water that requires additional time to settle out before the oil goes to the stock tanks. A 210-bbl. steel settling tank is shown in Figure 5 being used with a 315-bbl. steel wash tank. As a rule the oil in coming from the wash tank enters the settling tank at a point about 1 foot from bottom, is evenly distributed over the area of the tank through the use of a spreader like that previously described, and is usually covered with about 1 foot of water.

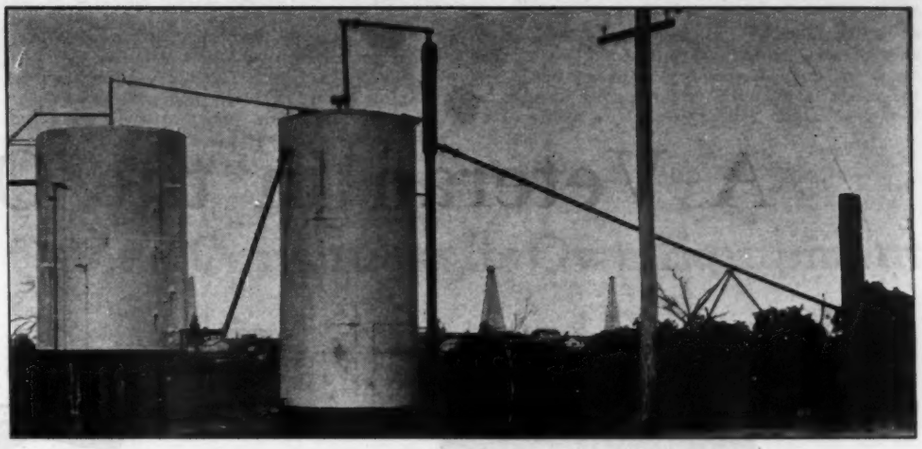

Fig. 5—Treating plant composed of boiler heater, wash tank and settling tank, Seminole area

Treating chemicals are applied to the emulsified crude in several different ways. The two common methods are known as "lead line" and "down-the-hole" treatments. In the case of the lead line treatment the chemical is injected into the lead line some place between the well and the heater. In down-the-hole treating the chemical is either poured or pumped down the annular space between the tubing and the casing with either water or fluid from the well put down behind it to thoroughly wash it to bottom. One of the most common means of pumping chemical is by the use of small chemical proportioning pumps. These pumps, of various sizes and capacities, are powered in several different ways. These pumps may be powered, in case of the ratchet driven pumps, by a wire connected to the walking beam at such a point as to deliver to the pitman on the pump the proper stroke, or in the case of the belt driven pumps may be powered by a 1-inch leather belt from the band wheel shaft on the back side of the band wheel.

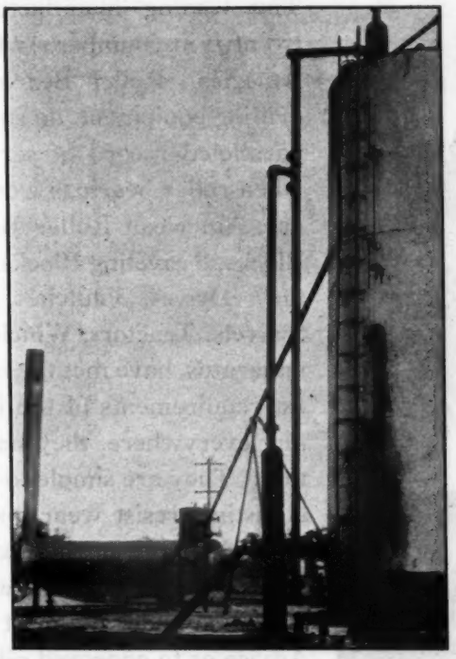

Fig. 4—Pressure proof syphon on wash tank in St. Louis Pool, Greater Seminole area

These have pumping capacities ranging from 1 pint per 24 hours to 2 and 3 gallons per 24 hours, depending upon size of the plunger, length and number of strokes. Most pumps have reservoirs, and capacities of these range from 4 pints to 3 gallons. Electrically driven pumps are used to some extent but are limited to locations close to power lines. One of the clutch or ratchet driven type pumps is shown in Figure 6.

Down-Hole Treating

In treating down-the-hole the chemical is pumped into the casinghead and a small stream of the fluid from the lead line is allowed to go into the casinghead with the chemical to wash it to the bottom of the hole. The lead line is tapped at some convenient point close to the well head above the casinghead so that a sight-feed body can be installed and the fluid going down the casing with the chemical adjusted to suit the operator's idea of the correct amount. In most cases a stream of fluid a little smaller than the ordinary lead pencil is sufficient to thoroughly wash the treating compound to bottom.

In the operation of a treating plant handling straight time production, little difficulty is encountered in keeping the plant operating efficiently once this condition has been reached, and providing all the factors conducive to proper treatment remain constant. This requires attention from the pumper or switcher in charge of the plant who must ascertain the proper quantity of chemical to be added to the fluid from the wells. He must also see that the temperature of the heater remains constant, that fluid levels in the treating tank or tanks remain at the desired level and by making periodic examination of the oil going to the stock tanks, to determine if the oil is clean enough for pipe line delivery.

The responsibility of operating these treating plants as efficiently as possible rests upon the engineer in charge. It is his duty to determine the formula and amount of chemical needed for proper treatment, the method of application, the temperature to be maintained on the heater, amount of water to be carried in the treating tanks, and also make sure that the oil is being sold to the pipe line at the highest possible gravity.

In order to keep the gravity and volumetric losses of oil held in stock tanks at a minimum the more efficient treating plants and tank bat-

Fig. 7—An example of a neat, efficient and well kept tank battery and treating plant in the St. Louis Pool, Greater Seminole area, Oklahoma

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teries are equipped with a vapor pressure system that permits holding a pressure on the tanks. These vapor systems are equipped with vacuum pressure relief valves so that excess gas may be vented to the air. In case of the rapid delivery of

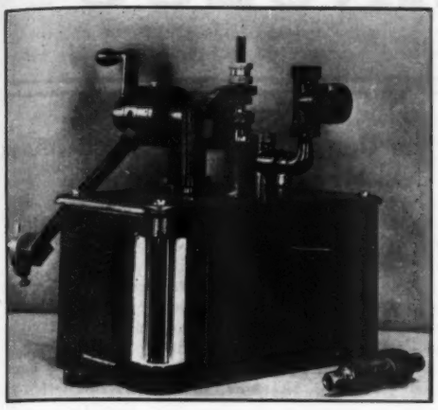

Fig. 6—One of several types of chemical proportioning pumps used in the Seminole area

oil to the pipe line, when an insufficient amount of gas is coming into the battery, the vacuum valve will admit air. One of these vapor systems is shown across the top of the battery in Figure 7.

Computation of Treating Costs

Treating costs are computed by using several different methods, and there is no standard system in use among the various companies. Probably the most common of these methods take into consideration only the cost of the chemical used per barrel of pipe line oil recovered. Another method is to figure the cost of chemical and the actual operating costs, while still another and one which is more accurate includes all operating costs plus all indirect charges. This method includes the amortization of all treating equipment, labor, supervision, transportation, fuel for heaters in case it is necessary to purchase same, maintenance, and treating chemical. This last method is perhaps the best in that it enables the operator to determine the exact cost of treating oil, while the other two methods mentioned deal only with the chemical consumed. These several methods produce a wide variation in treating cost between companies in that one method gives "chemical cost" only and the other gives the actual "treating cost." Chemical costs per barrel of oil recovered in the Seminole area range from $0.0040 to $0.040, with the average over the field at about $0.0080. Actual treating costs when figuring the cost of the treating equipment, labor, chemical, etc., are from $0.20 to $0.10 per barrel of pipe line oil recovered.

The recovery ratio of barrels of pipe line oil per gallon of chemical used varies from well to well and lease to lease depending upon treating method, chemical used, and treating equipment. This ratio in some cases is as low as 50 bbls. of oil per gallon of chemical and as high as 1,200 bbls. of oil per gallon of chemical. The temperature carried on the heater has a great influence on the amount of chemical needed for proper treatment. In case the fluid treated was yielding 400 bbls. of pipe line oil per day it might be found necessary to use 2 gallons of treating chemical and to keep heater temperature at 100° F., but should this temperature be increased to 160 to 180 degrees it is very probable that 1 gallon of the chemical would treat the oil as thoroughly as the first case. The objectionable feature of using the method employing the excessive heat is that the loss in gravity of the oil and also the volumetric loss is far more than the cost of the 1 gallon of chemical saved.

A very troublesome feature of oil treating in Seminole is that arising through the accumulation of "tank bottoms." These bottoms are the result of small percentages of emulsion entering the stock tanks with the treated oil and after filling the tanks several times this gradual settling will deposit sufficient emulsion in the bottom of the tank that it approaches the pipe line connection and must be cleaned out.

Most operators have installed equipment to retreat this accumulated emulsion in one of several different ways. In some cases the bottoms are steamed and then pumped back through the treating system. Others merely steam the bottoms by use of "sprays" in the bottom of the tank. After treatment all free water is drawn off and the tank put back into service.

In such cases where the accumulation is so slow that tank cleaning is infrequent, the bottoms are often drawn off and burned. This procedure is common with some operators in all cases but is a rather expensive practice and is not used generally.

Galena Constructs Its Own Equipment for Packing Grease and Oil in Tubes

By R. C. CONINE

FRANKLIN, Pa.—Galena Oil Corp. upon deciding to offer extreme pressure lubricants and greases in collapsible tubes, in order to minimize substitution and to increase the ease of applying the product, found that the necessary equipment could not be found. As there was no other recourse Galena called on its own machine shop to design and produce the necessary machinery, and the response has proven highly satisfactory.

Figure 1 shows the tops of oil and grease supply cylinders on the second floor. On the first floor the heavy greases are forced into the collapsible tubes by the unit shown in Figure 2. The circular member at the left end of the machine contains a revolving cylinder similar to that which would hold the cartridges in a gigantic pistol. The tubes in the cylinder are filled with grease, and these are emptied into collapsible tubes by means of a piston. Figure 3 shows the machine used in filling the collapsible tubes with flowing lubricants. A gravity trip assures proper measurement.

Although the machine for closing the bottoms of the collapsible tubes shows its origin in such easily recognizable parts as an automobile piston head, and the like, made into an eccentric cam, this is probably the most ingeniously designed unit of the system. The up-ended tubes are centered between the flat jaws of this machine, and a turn of the crank does the rest, turning out a neatly closed collapsible tube sealed by a reinforcing metal strip. This machine, now powered by hand, is being hooked up with a motor to speed up packaging. The feed line is likewise undergoing revision in the interest of speed.

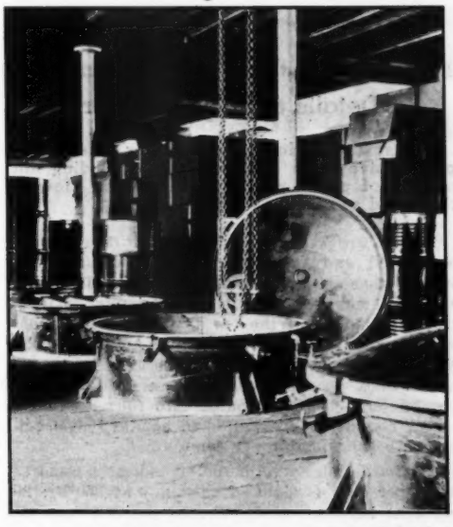

Fig. 1—Vertical supply cylinders in which air pressure is applied to force oils and greases through feed nozzles

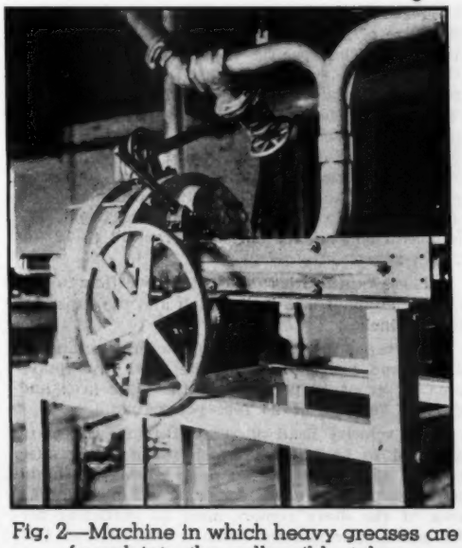

Fig. 2—Machine in which heavy greases are forced into the collapsible tubes

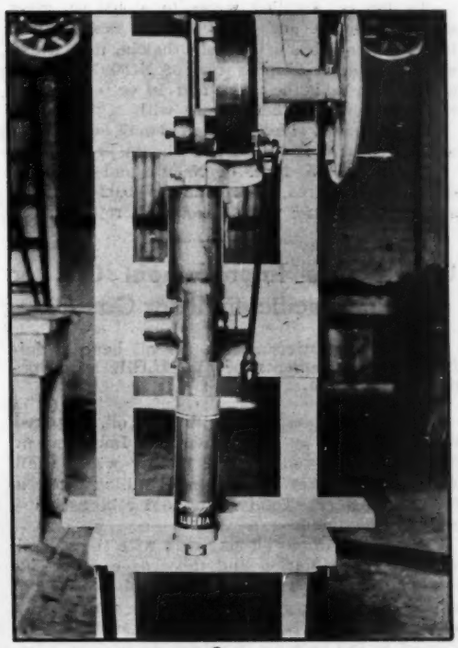

Fig. 3—Gravity meter filler for extreme pressure lubricants

Considerable saving is realized by utilizing a gravity feed system combined with the pressure system. The extreme pressure lubricants and greases are placed in the vertical supply cylinder leading from the second floor to the machines where the greases are forced into collapsible tubes. After the cylinder is filled, the oils and greases are forced through the system to the feed nozzles due to the applied air pressure and due to force created by the weight of the lubricants.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph.D., Technical Editor

Methods for Detecting Acid or Alkali In Lubricating Oil

It will be appreciated if you will be good enough to give us the description of a simple test which we can use for detecting acid in lubricating oil.—M. I. C.

The neutrality of lubricating oils should always be determined by a chemist because it is a very easy matter for an unexperienced person to come to an erroneous conclusion and thus cause misunderstandings.

The simple method for the detection of acids or alkalies is to shake a small quantity with hot distilled water and withdraw some of the water after standing a few minutes for test. The reaction will be shown by dipping blue and red litmus papers into the water; the blue changing to red if acid is present and the red to blue if the oil is alkaline.

Quantitative determinations may be made by either of the methods next outlined.

Samples of 5 to 10 grams of the oil are shaken for one-half hour with 50 cc. of pure, and especially neutral, alcohol. A small quantity of distilled water is added to the extract and titrated for acid in the presence of phenol phthalein with N/5 sodium or potassium hydroxide.

To 100 cc. distilled water in a 400 cc. glass stoppered bottle, add about 100 cc. gasoline and two or three drops of phenolphthalein, then shake well and add a drop or two of N/50 NaOH, or until barely alkaline. Now add 10 cc. of the oil, shake thoroughly, then titrate with N/50 NaOH.

The standard alkali solution should be replaced with N/50 acid if the sample should be alkaline.

If more than 2 cc. of N/50 standard alkali should be required, approximately 0.02 per cent acidity as sulfuric, the oil should be rejected.

United Gas Improvement Co., or U.G.I. Specifications for Gas Oil

What properties must a gas oil have to fulfill the requirements of the U.G.I. specifications?—H. E. M.

The U.G.I. specifications for gas oil, prepared some years ago by the United Gas Improvement Co., refer to an oil of good quality which shall show a recovery of 85 per cent distilling between 400° and 700° F. Total sulfur and coke each 0.5 per cent maximum.

The quality of gas oil may vary with the several methods of distillation and the type of oil. The best quality is known as virgin gas oil, a close cut obtained by primary distillation. The cracked gas oils vary in properties and the oils that have been reduced to the extreme are liable to contain large quantities of wax and heavy materials that produce objectionable deposits of coke in the gas-making units.

A good grade of gas oil will usually meet the following:

GAS OIL SPECIFICATIONS

Gravity, A.P.I.	32–38
Flash, min. ° F.	170
Fire	250
Pour	zero–45
Distillation between 400–700° F.	85%
Total sulfur	0.5
Coke	0.5

Gas oil is a secondary product, obtained between the light oil fractions (gasoline and kerosene) and lubricating oil so no effort can be made to make a close control of the characteristics, therefore, close specifications are not advisable except for special use where a premium above the market price is possible.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit problems to Dr. C. K. Francis. Questions should give as much detail as possible. Inquiries must be signed but only the given initials will be printed. The source of questions is considered confidential. Questions requiring discussion of patents, the use of intricate formulas, extended computations, or cost estimates cannot be considered in these columns.

Determining the Size and Internal Details of Bubble Tower

What calculations are used for finding the proper size of a bubble tower, including the number of plates and other details for flow of the liquid and vapors?—H. O. R.

There are several variables that have to be considered and the condition determined or assumed when designing a bubble tower. The various steps may be briefly outlined simply, to illustrate the nature of the variables, from Principles of Motor Fuel Preparation and Application by Nash and Hawes, where the several steps in the calculations are detailed. It is assumed that the hot oil is to be fractionated into four distillates and a residue. The tower is to handle 10,000 gallons (70,000 pounds) per hour.

A distillation curve of the oil indicates removal of 25 per cent (weight of gasoline) at 350°F.; 20 per cent kerosene at 510°F.; 10 per cent gas oil at 600°F. and 25 per cent paraffin distillate at 800°F., with a 20 per cent residue. The heat to vaporize the oil is estimated at 41,300,000 B.t.u. per hour. From the heat balance the required reflux ratio is found to be 6.63.

The internal reflux, based on a top vapor temperature of 228°F., is calculated to 171,850 pounds per hour. The specific volume of the vapors at the top of the tower is assumed to be 4 cubic feet per pound or a total volume of 757,400 cubic feet. The vapor velocity through the free space is 2 to 3 feet per second; assumed 2.5 feet per second. From this the diameter of the volume required is 10 feet, 2.5 inches. The height of the tower depends upon the number of plates, which must be decided from experience or actual experiment. The number commonly used ranges from 12 to 18, set 2 feet apart.

These authorities state the overflow weirs should be about 2.75 inches high and the caps 2.25 to 2.50 inches.

The vapor density at the top of the column is 0.25 pound per cubic foot. The total cap uptake area is set at 10 per cent of the plate area and gives a velocity of 26 feet per second.

The velocity head of vapor through the plate is found to be 52 feet, which for a 0.6 specific gravity oil at the boiling point gives the liquid oil height in the down comer at 4.2 inches. The area of the down comers must be sufficient for 573 gallons per minute, which is estimated at 47.4 square inches with a diameter of 8 inches.

The United States Bureau of Mines Method for Grading Oils

What is the United States Bureau of Mines method for grading crude oils?—L. E.

The original system for the grading of crude oils, as used by the U. S. Bureau of Mines, was shown in R. I. 2806 in 1927, to include four classes of oils, paraffin, asphalt, mixed or intermediate and naphthene. Recently, in R. I. 3279, these have been extended to show seven varieties, with a possible extension to nine. The classification is determined from the boiling-point gravity data of distillation fractions. The method is: (1) Observe the A.P.I. gravity of "Key fraction No. 1", the fraction distilling between 250° and 275°C. (482° and 527°F.) at atmospheric pressure. (2) Observe the A.P.I. gravity of "Key fraction No. 2," the fraction distilling between 275° and 300°C. (527° and 572°F.) at 40 mm. absolute pressure. The gravities of Key fraction No. 1 representing lighter fractions and those of No. 2 representing the heavier. If the gravity of No. 1 is 40 A.P.I. or lighter the lower boiling fractions of the oil are paraffinic; if 33 A.P.I. or heavier, they are naphthenic; and if between 33° and 40° they are intermediate. Similarly, if the gravity of key fraction No. 2 is 30.0° A.P.I. or lighter the higher-boiling fractions of the oil are paraffinic in character. They are naphthenic if key fraction No. 2 is 20.0° A.P.I. or heavier and intermediate if the key fraction is between 20 and 30 (20.1 to 29.9° A.P.I., inclusive). Thus, there are nine possible classes of crude oils:

1. Paraffin base: Distillates paraffinic throughout.
2. Paraffin-intermediate base: Light fractions paraffinic; heavy fractions intermediate.
3. Intermediate-paraffin base: Light fractions intermediate; heavy fractions paraffinic.
4. Intermediate base: Distillates intermediate throughout.
5. Intermediate-naphthene base: Light fractions intermediate; heavy fractions naphthenic.
6. Naphthene-intermediate base: Light fractions naphthenic; heavy fractions intermediate.
7. Naphthene base: Distillates naphthenic throughout.
8. Paraffin-naphthene base: Light fractions paraffinic; heavy fractions naphthenic.

Example analysis:

Paraffin-Intermediate-Base Oil

Chandler Field, Lincoln County, Okla.

Gravity 39.2 A.P.I. Sulfur per cent 0.28.

Pourpoint below 5°F. Say Univ. vis. at 100°F., 41 sec.

Color: Greenish black.

Distillation dry.

First drop 33°C.

Temperature:	% over	A.P.I. of cut
250–275	49.2	40.6
Distillation vacuum 40 mm.:		
275–300	26.7	29.3

Products summary:	Per cent	A.P.I.	Viscosity
Gasoline	32.0	61.3	
Kerosene distillate	17.2	43.2	
Gas oil	10.6	35.2	
Nonvis lub dist.	10.9	33.6–30	50–100
Medium lub. dist.	5.2	30–28.6	100–200
Visc. lub. dist.			Above 200
Residuum	23.5	19.0	

Carbon residue of crude 1.5 per cent; carbon residue of residuum 6.2 per cent.

References: Smith, N. A. C., Interpretation of Crude Oil Analyses, R. I. 2806, Bureau of Mines, 1927; Lane and Garton, Base of Crude Oil, R. I. 3279, Bureau of Mines, 1935.

Dr. Graham Edgar Discusses 100 Octane Motor Fuels

Success in the commercial production of aviation gasoline of extremely high anti-knock quality this summer has opened the way for new advances in the design of airplane engines, according to Dr. Graham Edgar, vice president in charge of research of the Ethyl Gasoline Corp.

Dr. Edgar points out that major oil companies have concentrated research during recent months on the production of gasoline of 100 octane value, the octane scale being the international measure for anti-knock quality in fuel. The first commercial order for 100 octane gasoline was placed recently by the U. S. Army, which will use 300,000 gallons in experiments on the increase of engine power without corresponding rises in weight.

"Gasoline of such ultra-high anti-knock quality permits further increases in the supercharging of aircraft engines, thus increasing the overall performance, the ease and safety of take-offs, and a quicker pick-up in emergencies," Dr. Edgar says. "Furthermore, it permits increases in compression ratios, with resultant decrease in fuel consumption. This is of vast importance for military long distance bombers, and for commercial transport where long non-stop flights are involved. The Pan-American clipper ship has made several trips from California to Hawaii, the round trip to the Midway Islands and Wake Island and recently completed a flight to Guam in mid-Pacific.

"The new Martin-built 'China Clipper' is expected shortly to inaugurate mail and passenger service to the Orient. It would appear that such a line may consider very seriously the adaptation of their engines to the use of 100 octane fuel, for even a relatively small decrease in fuel-consumption for the long hop from California to Hawaii would permit a substantial increase in valuable pay-load. The high price of the fuel would be more than compensated for, particularly when the price of the fuel is calculated on a basis of fuel-cost per ton mile of pay-load.

"I predicted last January that aviation fuel of 100 octane number or better would be made by synthesis from refinery gases. Present trends bear out this prediction. The only commercial gasoline of this quality at present available is a blend of good aviation gasoline, actual iso-octane (synthesized from refinery gases) and tetraethyl lead.

"Furthermore, the past season has witnessed unparalleled activity among petroleum chemists seeking to find the best means of making high anti-knock fuel by rebuilding the hydrocarbon molecules present in the refinery gases. In fact, several such processes are being employed commercially today, and it has been announced recently that four of the major gasoline-production companies have formed a new company to take over all their patents relating to production of high-octane fuels from petroleum sources.

"These processes produce gasoline by 'polymerizing' the refinery gases by means of heat, pressure and catalysts, and thus form gasoline of rather high anti-knock value (usually around 80 octane number). Perhaps a billion gallons of gasoline may eventually be produced from refinery gases now largely wasted.

"From the standpoint of high anti-knock aviation fuel, however, 'polymerized gasoline', in the sense that the trade uses the term today, does not seem to promise much. While the gasoline has an anti-knock value higher than that of the best straight-run gasoline, it appears to be very little improved by tetraethyl lead, with the result that even the usual 87 octane gasoline cannot be made from it, to say nothing of 100 octane gasoline. Apparently, the chief field of this polymerized gasoline will be for blending with the usual automobile gasoline to increase slightly the yield and anti-knock value.

"It is evident that still more research must be carried out before gasoline of 100 octane number or better can be produced in quantity and price to make it attractive to the commercial airlines. It is to be hoped that methods of reaching the goal other than the use of iso-octane itself may be developed, since the potential sources of iso-octane are somewhat limited, and the price cannot be brought into the present price range of aviation gasolines."

Your plans made real

If you are hoping for the chance to bring your refinery operations up to what you know they ought to be—if you have plans that have been shoved aside by harsh necessity—now is the time to get busy.

Now is the time to call Parsons.

Parsons' engineers will study your problems, understand your needs, perfect your plans.

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PROBLEMS FROM READERS

Edited by T. F. Smiley

Radio Device Finds "Lost" Pipe Line Faster Than the Pick and Shovel

We have under consideration the reconditioning of a pipe line which has been underground for some 15 years. In the meantime much of the land traversed by the line has been put under cultivation, with the result that all signs of the ditch have disappeared. In several cases where we dug down to find out the condition of the pipe we couldn't find even the pipe. Is there any instrument designed for the purpose of showing where underground pipe is? If not, is there not an easier way than digging with pick and shovel?—G. E. N.

In starting out on a job of reconditioning a pipe line the first thing to be done of course is to trace the course of the line and "flag" it within the right of way. Most pipe line operators believe they know precisely the location of their lines, but in many instances they do not know it. In some old lines or lines through cultivated areas, the face of the ditch has been obliterated and the line must be located definitely before work can begin. The hand probing bar formerly was the rather crude instrument used in this work. Its place is being taken over by the underground pipe locator. The apparatus, utilizing the radio principle, locates and traces any buried pipe line. The cost is small.

The locator consists of a high-frequency transmitter and a specially designed portable radio receiver operating with a selective directional loop antenna, which latter is carried in the hand of the operator. The pipe line and connections are "excited" by the transmitter, which transmits high-frequency pulsations between two grounded points. The signal is heard by the operator when he is directly over the line, being picked up by the loop antenna and amplified by the radio receiver.

One company has estimated that this instrument, operated by two men, will locate 10 to 20 times as much pipe a day (in "flagging" pipe to be uncovered) as the probing method. The instrument has also been found of value in finding unauthorized connections to pipe lines. One major pipe line company, suspecting such a tap on a gasoline line, found it in three hours.

Easy Needle Experiment Illustrates How Surface Tension Operates

In articles I have been reading recently, I came across the term "surface tension" in a discussion of oil movements under ground. While I have a general idea of what this term means, can you explain how it applies to production problems?—G. N. E.

Oil in underground reservoirs is usually found within small hairlike or capillary pores. This oil tends first to wet and then to cling to the material making up the rock or forming the pore spaces. Different types of rocks have different degrees of wetability; that is, some rocks will take up oil or water freely, while others are so dense only the surface of the grain of rock is moistened. The foregoing does not answer your question, and it is stated only to form a background for the explanation to follow.

Surface tension may be defined as a tendency of a liquid to act as an elastic membrane, the surface of which always tries to contract to the minimum area. It is a characteristic property of all liquids, but varies in different ones and in the same liquids at different temperatures and pressures. Gas dissolved in crude oil under pressure will reduce the surface tension of the oil, especially if the temperature of the oil is increased. This being the case, it is easy to understand how crude oil will flow more freely through capillary pores in the formation when gas is in solution, for the oil has less tendency to form a membrane-like film over the grains of sand and will flow through the pores more readily.

Surface tension can be illustrated by a simple demonstration, one perhaps you have performed or seen performed, the floating of a needle on the surface of a glass of water. To do this trick the needle is first slightly greased by wiping it on the hair of one's head. The natural oil in the hair is sufficient to cover the needle with a thin oily coating. When the needle is placed gently upon the surface of the water, the latter is prevented from wetting the needle and it floats in a tiny depression made on the water surface.

Surface tension and interfacial tension should not be confused and for a discussion of the latter phenomenon you are referred to an article by Allen D. Garrison, in The Oil and Gas Journal, of August 15, 1935.

Readers are invited to send questions relating to drilling, producing and transporting operations. These questions will be referred to persons capable of answering authoritatively. The names of those writing for information will be held confidential, initials only being published. This department cannot undertake to answer questions involving investments, patents or intricate formulas or those which properly should be submitted to consulting engineers, geologists or lawyers.

WHY THEY CALLED IT *Four-Foot Gas*

"Four-foot gas" is the name jocularly applied to wood cut into 4-foot lengths for firing the boiler in drilling oil wells where gas, fuel oil or coal is not available or where the press of financial necessity leads to the use of this inexpensive fuel. Four-foot gas was common in the early day oil fields and it has been resorted to from time to time since then. The Strake discovery well in the Conroe Field, Texas, was drilled with 4-foot gas. Whatever other reasons there may have been, a thoroughly binding one lay in the fact that George W. Strake had literally put his last dollar on this well, having decided to "trust to God that his money would hold out." It did.

Theories Concerning Heaving Shale and Methods of Preventing It

Is it unusual to find caving shale in a rotary-drilled well? What explanation is offered for them? What has been done to overcome the difficulty where such conditions have been encountered?—G. D. O.

It is not unusual for drillers to encounter caving shale in wells drilled with rotary. Operators in the Oklahoma City Field met this difficulty and in many cases they overcame it by using heavy muds to wall the hole and thus control the caving. The same trouble has faced drillers in the Fitts Pool, in Oklahoma.

Many reasons for caving shales are offered. Some operators express the opinion that the laminated character of the bedding planes causes strains within the formation and as the hole is drilled through such formations the material surrounding the hole is unsupported and thus tends to slough into the hole, continuing this movement until equilibrium within the stratum is established.

Another theory is that the wetting properties of the mud fluid cause the shales to dissolve and mix into muds that flow into the hole.

A third theory is that there are compression stresses within the shale stratum which are relieved when the drill makes the hole and these pent-up forces cause the shale particles to move to the point of low pressure, which of course is the open hole, where they continue to accumulate until the compression strains are relieved for some distance back of the drilled hole.

More Information Than This Needed in Solving Spacing Problem

I am drilling in southern Marshall County, in the shallow production area, wells being around 500 feet in depth. The oil is 25 plus gravity, heavy and frothy. The sand is 10 to 20 feet thick. My problem is that of determining how far apart the wells should be placed to get the maximum production. Of course cost is a consideration also. Should they be placed closer together than 300 feet? If so, how much?—C. H.

To begin with, has the Corporation Commission of Oklahoma placed any restriction on well spacing in your area? In most new fields the proper density of wells is agreed upon by the owners of surface rights and then orders in harmony with this agreement are issued by the conservation officer of the Corporation Commission's oil and gas department. If this has not been done in your area it would be necessary to have much more information than you provide to decide what the well spacing should be.

Do the wells flow naturally? If not, what is the fluid level in the hole? What is the porosity, permeability and saturation of the sand? Does gas or water accompany the oil? Is the structure an anticline, syncline, terrace or of some other type? How long has the field been producing, and what recovery has been made to date per well? What is the present well spacing and is it uniform for the field?

Without accurate information on these points any engineer to whom your question might be submitted would simply be guessing. Your problem can be worked out in a scientific manner as indicated by a ruling handed down by the Supreme Court of Texas, June 12, 1935, in deciding upon a well spacing case involving wells in East Texas. Your guess is 300 feet, which is all right so far as it goes, and an engineer's would be no more accurate without the additional information.

California, an Oil Empire

California, a name applied in Spanish romance as early as 1520 to a fabulous island near the Indies and "very near the Terrestrial Paradise," always has enjoyed this sixteenth century appellation, both on the part of its residents, the thousands of visitors who tour the state every year and in the minds of a vast part of the population of the United States whose great, secret ambition is to "go to California."

For oil men California has a particular lure. That state has produced one-fourth of all the crude oil brought to the surface in the United States since the drilling of the Drake well. It is estimated about one-eighth of the world's oil business is concentrated in California, and the state embraces one-fourth of the world in its marketing operations. It has made history in the petroleum industry in many ways. The first oil burning locomotive in the world was equipped by a California oil company and the state led the way in the use of fuel oil in maritime shipping. In operating methods and equipment, the oil business in California holds an enviable position. The first well in the world to be drilled below 10,000 feet was in California. The technique of directional drilling reached a high stage of efficiency in that state and California oil men and equipment manufacturers gave the petroleum industry the solution to many problems which handicapped operations in other sections of the country.

Pioneering Spirit Dominated

Outstanding in the unique history of the state is the pioneering spirit which prevailed since the first white man trod its soil, then under Spanish rule. Pioneers naturally attract pioneers and the history of California is replete with expeditions and rushes which took hardy, daring and ambitious men and women from all other sections of the country to the Pacific Coast. And it is but natural that this pioneering spirit, the very life of the petroleum industry, resulted in the starting of oil operations in California very shortly after the drilling of the Drake well in Pennsylvania.

It is rather remarkable that the petroleum industry became established in California with drilling and refining operations long before such development existed in many of the present oil producing states east of the Mississippi. In fact it is recorded that in 1850, nine years before Drake drilled his well near Titusville, Pa., Andreas Pico, a Spanish don, and his nephew, Romulo Pico, extracted crude oil for experimental and refining purposes from seepages and hand-dug pits along the canyon near Newhall which now bears their name.

The existence of petroleum in California has been known since 1792, according to a report made by Benjamin Silliman, Jr., on the petroleum region of Santa Barbara County in 1865. The California Indians were familiar with the location of the various tar beds and seepages and they used the asphalt in fastening the arrow and spear heads to wooden shafts. The Partola expedition, en route from San Diego to San Francisco, encountered Indians a few miles from Santa Barbara making wooden boats and pitching them within and without with asphalt. This place Partola named Carpenteria which means, in Spanish, the "carpenter's shop." The Indians used the light oil from the seepages for medicinal purposes and as an article of commerce between the coast tribe and Indians in the interior.

Present Gigantic Proportions

From such a humble beginning the petroleum industry in California has arisen to its present gigantic proportions with a total crude oil production up to October 1 of this year of 4,398,375,598 bbls. or one-fourth of all the crude oil produced in the United States since the drilling of the Drake well. The State has more than 16,000 producing

The harbor and city of Long Beach with the Signal Hill oil field in the background

oil and gas wells; a proven acreage of 126,550; 65 operating refineries; 91 operating casinghead gasoline plants; 6,000 miles of pipe line; storage facilities for 233,464,000 bbls. and a potential production which has been rated at 1,000,000 bbls. a day.

In its operation, the petroleum industry of California has pioneered in many ways. One example is the action taken when an overproduction developed in the Los Angeles Field, on the outskirts of Los Angeles. This field was discovered by E. L. Doheny who in 1892-93 dug a shaft to a depth of 155 feet by hand, from which a few barrels of heavy oil per day were produced. Soon after, he drilled a shallow well in close proximity to the hand dug shaft and developed a production of 10 bbls. per day. Within a short time several hundred derricks were erected and most of them resulted in producing wells, with an initial output of between 20 and 60 bbls. per day although three wells produced from 200 to 400 bbls. per day. An overproduction of heavy oil suitable for fuel only, soon developed.

Oil companies, realizing there was a greater supply than the then market could absorb, set about building an additional market. The Union Oil Co., working on the assumption that the railroads would be large consumers if it were possible to substitute oil for coal, borrowed an old locomotive from the Santa Fe Railroad. It was taken to Santa Paula and fitted with oil burning equipment. After several months of work the experiment was pronounced a success, and a new era was opened to the oil industry in California. This is the first record of a railroad locomotive in the world to burn fuel oil. Soon after the Santa Fe and Southern Pacific Railroads installed oil burning apparatus and a good demand for fuel oil was created.

E. L. Doheny and Frank R. Seaver on site of first well Doheny dug near Los Angeles in 1892

Mined for Crude Prior to 1865

Prior to 1865 crude oil was obtained in California by mining operations. Tunnels and pits were dug by hand into the sides of a mountain near Newhall and the oil flowed by gravity and was collected in tanks in the mouths of the tunnels which varied in length from 10 to 2,000 feet. Such mining operations are of particular interest in view of the fact the petroleum industry in recent years has been experimenting with mining processes.

Wells among palms

The beginning of the petroleum industry in California on a commercial scale dates from 1861 when two companies were incorporated in the state for the purpose of finding, producing and dealing in petroleum products. These companies were the Santa Barbara Dead Whale Asphaltum Mining Co. and the San Francisco & Humboldt Kerosene Oil Co. There is some doubt as to the date of the drilling of the first well for oil in California. It is recorded that in 1857 the Dryden well, from which oil was bailed and sold, was dug in the western part of what was later the Los Angeles City Field. In the same year a small refinery was erected at Carpenteria to treat "Maltha," collected from nearby seepages, but no wells were dug.

Refinery Built in 1861

George F. Gilbert, a merchant of Ventura, Calif., built a small refinery on the banks of the San Antonio creek in the Ojai Valley in 1861. He obtained his crude from tunnels and seepages and later supplemented this supply from hand dug wells near his plant. Mr. Gilbert and others interested Thomas Scott of Philadelphia in the possi-

An extensive part of the oil industry. Loading tankers at dock in Los Angeles harbor

bilities of the oil business in California and a company was subsequently formed, and in the early part of 1865 the first complete set of drilling equipment was sent to California. The first well was drilled about 5 miles from the town of Ventura and abandoned in 1866 at 500 feet. The second well, 5 miles away, found a little oil at 520 feet. Two other dry holes were drilled about 20 miles from Ventura. A fifth well in the same locality was drilled with a spring pole and at approximately 90 feet oil was struck, the hole yielding a small quantity of light oil. A sixth well was drilled nearby with the machinery from New York, and it was good for 15 or 20 bbls. a day of good oil from 550 feet. This hole remained productive for many years.

and orange groves

Leland Stanford attracted by seepages in Ventura County drilled a tunnel 80 feet long on the out slope of Sulphur Mountain with the floor so inclined to the mouth that the oil flowed by gravity into tanks a little lower in elevation. This project was finished in 1866 and proved so feasible this method of producing oil was carried on intermittently with varied success for 25 years or longer.

Silliman Report Starts Boom

Early in 1864 Benjamin Silliman, Jr., a teacher of chemistry at Yale, was sent by private interests to California to report on prospects of petroleum there. His report appeared so favorable that an enthusiastic interest developed in California oil, both in the East and in the State itself. By 1865 some 62 oil companies had incorporated in California alone, not to count a score of individual efforts, partnerships, associations and companies incorporated outside the state. This activity spread over all of California but centered mainly around oil and tar seepages and natural asphaltic deposits in Humboldt, Santa Barbara, Ventura, Los Angeles and Kern Counties. The activity was intense for a time, but by 1867 the flurry of the first excitement was over.

Between 1861 and 1867 as many as 70 or more oil companies, capitalized at $45,000,000, had drilled 50 wells and invested $1,000,000. The total return had been 5,000 bbls. of oil, valued at $10,000 and many investors were dejected. The industry waned and for eight years there was little or no activity.

In 1875 C. A. Mentre drilled the first successful producer in Pico Canyon with a spring pole. The hole produced about 2 bbls. of high gravity oil from around 50 feet. Production was doubled by deepening to 75 feet and a deep hole carried to 600 feet made the well good for about 150 bbls. a day. Mentre's success attracted considerable attention and led to the formation of a number of new companies and to the discovery of a dozen small fields in Ventura and northern Los Angeles counties during the next 17 years.

In 1876 Mentre assigned his lease to the California Star Oil Co. In 1879 McPherson and Felton organized the Pacific Coast Oil Co., which later was absorbed by the Standard Oil Co. of California. From 1875 to 1892 the annual production of California increased, from about 10,000 to nearly 500,000 bbls.

During these years of drilling numerous attempts were made to refine the crude oil, but the first practical refinery was not finished until 1876. It was erected by Scott & Wood near Newhall with a capacity of 20 bbls. a day.

The first pipe line in California was laid in

Aerial view of Oleum refinery of the Union Oil Co. at Oleum, Calif.

WHEN A MAJOR COMPANY BELIEVES A RECORD IS NEWS—*it usually is interesting reading!*

Baker Cement Float Collar

JULY-AUGUST, 1935

simply the end of the original crustation " pletely replaced with a thin normal Triton deposition.

Union Oil Sets Heaviest String of Casing

DURING THE month of July, the heaviest string of casing ever set in any well drilled in California, and the longest string of comparable size ever set in any part of the world, was run in and cemented off by the Union Oil Company. This occurred in the Lillis Welch No. 1 well which is being redrilled by the company under contract with the North Kettleman Oil and Gas Company, and which is located in the northwesterly portion of Kettleman Hills about two and a half miles northwest of the Union Oil Company's Amerada lease.

After a number of unsuccessful attempts to redrill the well, the company removed the original 7-inch casing and resumed work from the end of the 11¾-inch casing at 6710 feet. In drilling ahead, there arose the difficulty of keeping such a large amount of open wall in condition, so, upon reaching 9,085 feet, 8⅝-inch casing was set to 9,081 feet.

This record string weighs 36 pounds to the foot. Standard casing and couplings were used, with the exception of the last 2,900 feet which is special, high tensile strength casing with thin couplings. The total weight from grass roots to bottom is 326,916 pounds—about the weight of a passenger locomotive and tender.

At present the well is being drilled ahead around 9,200 feet, and it is planned to set 6⅝-inch casing to about 10,900 feet. If successful, the weight of this string will exceed 305,000 pounds.

Extract from The Union Oil Bulletin July - August, 1935.

Sectional view of Baker Cement Float Shoe showing method of concrete and a minimum amount of Bakelite.

Successfully run in 13 hours, 20 minutes and the crews took time out to eat.

A Baker Cement Float Shoe and two Baker Cement Float Collars were used, with the same efficient results that operators around the world have come to expect from . . .

BAKER CEMENT EQUIPMENT

for guiding—floating—cementing casing

BAKER OIL TOOLS, INC.

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1879 from Pico Canyon to a refinery near by. The line, 2 inches in diameter and 5 miles in length, did not require any pumping equipment as the oil flowed to the refinery by gravity. The first pipe line to tidewater followed shortly after, the line being 4 inches in diameter and extending 16 miles from Santa Paula to sea level at San Buena Ventura.

Tanker transportation of crude oil began in California early in 1888. Tankage and dock facilities were constructed at San Buena Ventura soon after the construction of the pipe line and wooden steamers were built at San Francisco. Two of these tankers had a capacity of 6,500 bbls. each.

The industry in California gradually extended its sphere of operations over a wider territory in the state and built up a substantial production. Overproduction was a continual problem and much oil of fuel grade remained unsold with prices at a low level. The price situation improved, however, at the beginning of 1911 and from 1911 to 1920, inclusive, the average price of crude rose steadily from 48 cents to $1.72 per barrel, notwithstanding a constant increase in production. The price began to rise first because of the increased sale in foreign markets and an increasing domestic demand and later to the abnormal demand created by the World War.

Era of Big Discoveries

The era of big discoveries in California started in 1920 and from 1920 to 1924, inclusive, the industry experienced the discovery and intensive development in the Los Angeles Basin. Huntington Beach, Santa Fe Springs, Long Beach, Torrance, Dominguez, Rosecrans and Inglewood were opened, one after the other. Four town lot fields were developed, bringing the production in 1923 to 263,728,895 bbls. Huge concrete reservoirs were built and numerous steel tanks erected in an effort to tide the flood, and although 50,000,000 bbls. of additional storage were provided, it only helped temporarily. One company even tried to pump Santa Fe Springs crude into its wells in another field, hoping to recover it at a later date. The plan did not work out successfully.

Operators organized the Southern California Producers Committee in 1923 with S. A. Guiberson as chairman. Producers arbitrarily curtailed their production at the request of the committee and while not all the independent operators joined in the movement, this restriction helped the marketing companies to overcome a serious situation.

The enormous new production from the Los Angeles Basin was of a refinable grade. As a result millions of barrels of this crude were shipped to the Atlantic and Gulf Coast ports by tank steamers operating through the Panama Canal. These shipments became a great factor in establishing California permanently in the world markets by way of the Panama Canal.

California's banner year in point of total production was 1929, when 292,036,911 bbls. of oil were produced, exceeding the previous remarkable record of 263,728,895 bbls. chalked up in 1923. Santa Fe Springs and Long Beach were again the dominating factors in 1929 and these two fields were blamed chiefly for the serious overproduction which prevailed that year. The daily average production throughout this record-breaking year was 800,101 bbls. The peak of the daily average output was reached in August with 878,495 bbls.

Andreas Pico, who extracted oil from pits in California in 1850

Difficulty in obtaining co-operative action in curtailing production, especially in the Los Angeles Basin, has resulted in other periods of overproduction since 1929. Major purchasing companies found it necessary in 1931 to drastically reduce the crude oil prices in an effort to bring supply more nearly in balance with demand. Such action in 1931 brought desired results in a comparatively short period and prices were restored to former levels. The same situation, complicated by disagreements regarding gasoline marketing practices, brought a drastic price cut on August 29 of this year. The period of low prices continued until October 26 when the Union Oil Co. raised prices in the fields where it purchases, in some instances the new prices being higher than those which prevailed prior to the cut of August 29.

Tideland development for oil got an early start in California. When commercial production was developed at Summerland in 1894 operations were carried out into the ocean and at one time there were 100 active operations in this small field, far beyond the low tide line. Drilling was done with portable rigs and the lightest of casing. The Southern Pacific Railroad had one drilling wharf which extended out 1,230 feet from shore.

This tideland drilling is in marked contrast to present operations in the open ocean at Elwood, where gigantic foundations, steel piers and a steel island form the basis of operations and where multiple drilling has reached such a high state of efficiency with three wells being drilled from one derrick.

Enviable Position in Industry

The position held by California has been attained through a harmonious development of all branches of the petroleum industry, in which crude oil production, refining, pipe line transportation and marketing have been tuned to a common cadence.

At the present time, California is supplying about one-fifth of the crude oil produced in the United States, its 65 operating refineries processing about 500,000 bbls. of oil daily.

Within the state may be found crude oils of widely varying characteristics, which in turn permits California refiners to manufacture an exceptionally large number of special products along with the customary refined oils. Some of the crude is of such low gravity as to be practically valueless for skimming and is utilized as fuel oil and as cracking stock. In other sections of California crude oils are being produced which closely approach an unfinished gasoline in quality.

Hemmed in by the Rockies on the east and the Pacific Ocean on the west, California refiners early decided to expand their markets by means of water transportation. A representative annual shipment of petroleum products from Pacific ports would reveal a total of something like 70,000,000 bbls., of which approximately 60,000,000 bbls. are refined oils and 10,000,000 bbls. crude oil. In 1934 the actual shipments from California totaled 71,552,000 bbls. and were 17 per cent higher than in

Night scene at Huntington Beach when that pool was in midst of its greatest activity

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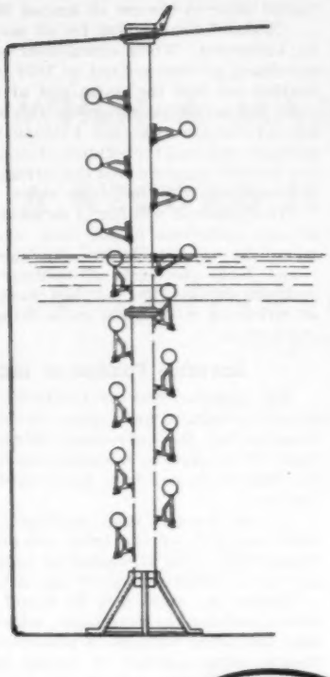

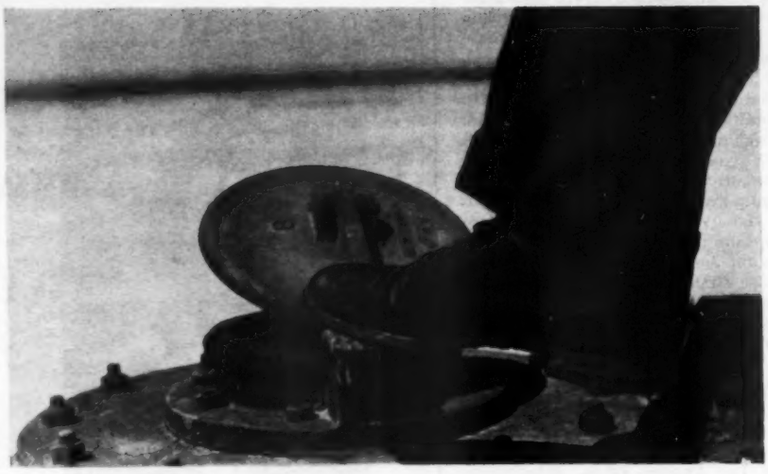

WITHOUT LOSS OR DANGER

S&J

When you reduce to gallonage loss the vapor that a 55,000-barrel tank under a pressure of 1″ of water will dissipate every minute that an 8″ gauge cover is held open, then the real economy of the S. & J. Gas Tight Sampling Well becomes apparent.

At the left, above, we illustrate the construction of the patented S. & J. Sampling Well which is listed by the Underwriters' Laboratories. In operation, all valves above the oil level are closed and held securely in position by the weight of the arm and float and the pressure of the gas. All valves below the oil level are held open, permitting sampling from any oil level without loss of vapors.

The use of the S. & J. Gas Tight Sampling Well not only provides a simple and fool-proof method of preventing the gallonage loss incident to sampling through open hatches in a tank in which gases are held under pressure, but it also obviates the hazard of asphyxiation and avoids damage to tank roofs.

The Sampling Well is but one of a large family of safety and conservation devices manufactured by this company which are fully described and illustrated in our catalog No. 52-B. If you are interested in quality tank fittings that will save you time and money, then you should request a copy of this catalog today.

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1933. Of this total in 1934, 24,628,000 bbls. were shipped to the Atlantic Coast, about half of which quantity was fuel oils and about one-third of it was gasoline. Oil shipments totaling 34,858,000 bbls. went to Pacific foreign ports, 5,373,000 bbls. of which was gasoline, 15,090,000 bbls. fuel oils, and 10,070,000 bbls. unrefined crude. California refiners also reached the Atlantic foreign market to the extent that a total of 3,269,000 bbls. of oil was supplied to these countries in 1934, approximately one-half of the total being gasoline and the other half being made up of fuel and Diesel oils. The balance of the 71,552,000 bbls. of oil leaving California refineries found its way into the United States Pacific possessions, the Gulf Coast, and the Panama Canal zone.

Shipments Higher This Year

Crude oil shipments from California to Pacific and Atlantic foreign ports during the current year to date are substantially in excess of similar shipments last year. California marketers shipped more crude oil to Pacific and Atlantic foreign ports during the first nine months of 1935 than they did during the entire 12 months of last year. Crude oil shipments to Pacific foreign ports last year totaled a little in excess of 10,000,000 bbls. as compared with 10,700,000 bbls. the first nine months of this year. Crude oil to Atlantic foreign ports in 1934 totaled 167,000 bbls. and for this year to date 1,210,000 bbls. Shipments of gasoline to Atlantic foreign ports during the first nine months of this year are approximately 60 per cent higher than total similar shipments during the entire 12 months of last year. Gasoline shipments to Atlantic foreign ports last year totaled 1,500,000 bbls. as compared with 2,350,000 bbls. the first nine months of this year. Shipments of gasoline to Pacific foreign ports are averaging approximately the same as during last year when 6,400,000 bbls. were lifted. During the first nine months of this year 4,555,000 bbls. of gasoline have moved from California to Pacific foreign ports. Shipments of natural gasoline to Pacific and Atlantic foreign ports are running substantially in excess of amounts lifted last year. During the first nine months of the present year 315,000 bbls. of natural gasoline were shipped from California to Pacific foreign ports as compared with 388,000 bbls. during the entire 12 months of last year. There were no shipments of natural gasoline to Atlantic foreign ports last year, but marketers have shipped a little more than 400,000 bbls. during the first nine months of this year.

Technical Developments

In technological developments, the refining industry in California has more than kept pace with the oil industry generally. There is one outstanding difference between representative California refinery operations and those of the balance of the country, however, namely, California utilizes cracking to a much lesser extent than the balance of the industry. This can be explained, in part at least, by the unusually favorable fuel oil market and the high anti-knock value of the gasoline made by natural distillation of the crude. to emphasize California's importance as a supplier of fuel oil, it is interesting to note that 9,215,344 bbls. of bunker oil alone were placed on vessels in foreign trade loaded on ships at Los Angeles and 1,242,049 bbls. at San Francisco. The total quantity represents approximately one-third of the entire bunker oil loadings throughout the world.

California has a splendid system of natural gas pipe lines which permit most of the larger cities to enjoy the use of this fuel. These lines extend from the fields in the central and southern part of the state south to San Diego and north to San Francisco, Sacramento and to Chico, north of Sacramento.

The natural gas situation in California is different from that of most other areas in that most of the supply comes from oil fields, it being estimated that 94 per cent of the present natural gas reserves of the state are located in oil fields and only 6 per cent in natural gas fields. Kettleman Hills is estimated to hold 70 per cent of the state's natural gas reserves. There are only three commercially productive natural gas fields in the state at this time with several others supplying small quantities and two recently opened fields—Tracy and Buena Vista—giving indications of developing commercial production.

Pipe Line Development

Pipe line development in California for the transportation of crude oil kept pace with the extension of discoveries outside the Los Angeles Basin. The first pipe lines, naturally, were constructed in the Los Angeles area and lines were built to the coast, where refineries were located and to facilitate transportation by water. A unique pipe line system was constructed in 1897 by the Alcatraz Refining Co. from its heavy oil seepages in the Santa Maria Field to a small refinery near Gabiota. The system consisted of a 3 and a 4-inch line in parallel and was operated by pumping distillate from the refinery to the field and mixing it with the thick, viscous oil so as to make possible the pumping of the latter from the field. In 1902-03 the Standard Oil Co. completed its 208-mile 8-inch line from the Kern River Field to Richmond, where it has its big refinery.

Transportation of gasoline by pipe line began in California in 1928, when the Shell Oil Co. of California constructed a 4-inch welded line from the Ventura Avenue Field to its refinery at Wilmington, near Los Angeles Harbor, a distance of 97½ miles. At that time this was the longest gasoline pipe line in the United States and, as far as can be ascertained, was the first pipe line in this country to operate with automatic pumping stations.

Drilling and Production Records

Among other oil records held by California is that of drilling the first hole in the world to a depth of 10,000 feet. This feat, which created a stir at the time, was accomplished in May, 1931, by the Chanslor-Canfield Midway Oil Co., a subsidiary of the Santa Fe Railroad, when its No. 2-A Hobson, midway between the Ventura Avenue and Rincon Fields, in Ventura County, was bottomed at 10,030 feet before drilling operations were abandoned. A test failed to show commercial production and the hole was plugged back to 7,000 feet.

In April of the same year the Associated Oil Co. had won for California the distinction of drilling the deepest commercial producer in the world at that time, with the completion of its No. 57 Lloyd, in the Ventura Avenue Field. The well, at a depth of 8,823 feet, began flowing at the rate of 5,282 bbls. of oil, with 4,204,000 feet of gas.

The largest well in California was completed in the Maricopa Field when the Union Oil Co.'s No. 1 Lakeview blew in on March 15, 1910, flowing 15,000 bbls. a day. The production increased until May 18 when the well was flowing 70,000 bbls. daily. The average from that date until July 12, when the well began to decline, was 50,000 bbls. a day, the well running wild all this time. Approximately 9,000,000 bbls. of crude was produced by this well during its flowing period, which continued for 18 months.

Value to the State

Naturally such an enormous business as the petroleum industry in California means much to the state in the way of revenue from taxes, employment, and vast purchases of equipment and materials. The state of California this year will receive in revenue from gasoline taxes alone $41,000,000. The direct taxes — city, county and state — in 1934 totaled $25,000,000 in addition to gasoline taxes which last year amounted to $40,000,000. Since the inauguration of the gasoline tax in California and up to the first of this year the state had collected $267,251,453 in revenue from this source alone.

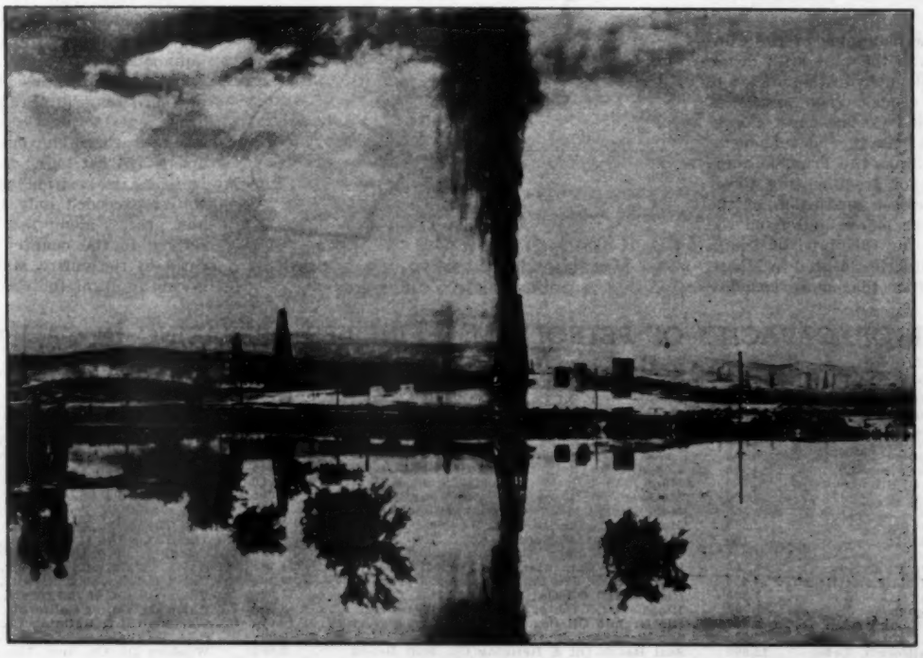
The Outlook in California

Growing realization upon the part of the petroleum industry in California that the rated crude oil production potential of the state is greater than the ability of the fields to produce; the fact no discoveries of importance have been made to build up declining reserves; and because consumption and demand for California oils have shown appreciable increases, all have an important bearing on future conditions in California.

It has been estimated that in order to maintain its position in the industry and in the export markets, California operators must discover about 200,000,000 bbls. of new reserves annually. There have not been discoveries in recent years even coming near this figure.

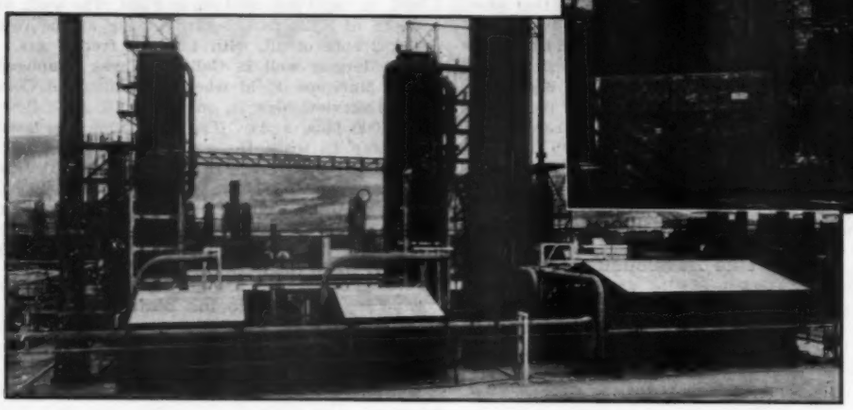
Proration in half a dozen of the principal producing fields in the state practically has been lifted, due to several reasons among which are given the demand for crude; the fact the fields are declining in production; many operators on small tracts; water intrusion; and inability to obtain 100 per cent co-operation in efforts to curtail. Many operators in California are definitely of the opinion the policy of the industry there must be to gradually eliminate proration in fields throughout the state, due to declining production in these fields and the need for more production.

While wildcatting operations are being carried on throughout most promising areas which have been surveyed, generally, with the seismograph, and drilling at this time is at an especially high level, results are not promising for the discovery of new, prolific productive areas. Many operators believe the future reserves will have to be obtained from deeper drilling and developing deeper production in rocks of an older age. Repressuring of depleted oil zones with natural gas may become a factor in future operations.



California's greatest well, Union Oil Company's No. 1 Lakeview

More than 60 years of improving distillation equipment passed between building of these two refineries. The one on the right



was erected at Newhall in 1876 and was first to operate in California. It was recently reconditioned for display. The picture on the left shows a modern distillation unit now operating in a refinery at Richmond.

California Refiners Process More Than Half Million Barrels of Crude Daily

By W. T. ZIEGENHAIN

Blocked by the Rocky Mountains from moving its products far inland, the California refining industry early set out to intensively develop local markets and to utilize water transportation in distributing its wares abroad and along the East Coast. In so doing, it has forced its way upward to gain second rank among all states in the United States in the matter of total crude capacity.

California refiners now process about 500,000 bbls. of crude daily and make about one-fifth of all the motor fuel manufactured in the United States. California has given generously to the rest of the refining industry in the way of technological developments in processing and improved merchandising. There was a period not so many years ago, and when California was finding new oil producing fields and rapidly developing its refining industry that a saying developed something like "If it's new, it came from California."

One of the principal contributions of the California refining industry was the pipe still, developed first for the economic dehydration and topping of several unusual crudes. The names of M. J. Trumble and the Shell Co. are most closely associated with this work. Another development, dating back to about 1915, links the Trumble name with the bubble cap type of fractionating tower which permitted a much closer separation of the crude oil fraction than ever before and from the $75,000 expenditure made for this type of equipment for installation in refineries located in Martinez and Coalinga came proof that more gasoline could be taken out of the crude and this in turn started the entire industry along its program of utilizing more compact and efficient distillation and fractionating equipment.

Map showing location of principal refineries in California

California is unique, however, in that it did not utilize cracking as extensively as its position within the oil industry would suggest. California produces just a little more than one-fourth of its gasoline by cracking while the balance of the industry in the United States produces about one-half of its gasoline by cracking.

Of course, there are good economic reasons for this such as the relatively favorable market for fuel oil, availability of ample crude, the gasoline made by straight distillation has a relatively high antiknock value and its volatility may be built up by using ample supplies of natural gasoline. Natural gasoline represents about one-sixth of the total motor fuel production in California at the present time, and yet production is restricted by curtailment of crude production.

The California refining industry divides itself automatically into two major areas, the southern, sometimes known as the "Los Angeles," and the northern or "San Francisco region." In all there are about 80 plants, approximately 64 of which are operating. The operating units could process up to 784,000 bbls. of crude oil daily and this justifies its position as second largest among all states, exceeded only by Texas. These 64 plants now process about 18.5 per cent of the total crude refined in the country or about the quantity refined in the entire Mid-Continent and more than is run by all of the East Coast refineries.

CRUDE OIL CAPACITY OF PETROLEUM REFINERIES OPERATING IN CALIFORNIA

Company and location—	Daily crude capacity
Ajax Oil & Refining Co., Clearwater	3,000
American Oil Refining Co., Long Beach	1,500
Associated Oil Co., Associated	52,000
Associated Oil Co., Watson	9,500
B. & F. Oil & Refining Co., Venice	2,500
Bachmann Petroleum Corp., Long Beach	2,500
Bell View Oil Syndicate, Santa Fe Springs	2,500
R. R. Bush Oil Co., Long Beach	3,500
Caminol Co., Ltd., Hanford	2,500
Caminol Co., Ltd., Santa Fe Springs	3,500
Capitol Crude Oil Co., Santa Paula	150
Casmalia Co., Casmalia	1,000
Eagle Oil & Refining Co., Santa Fe Springs	1,500
Edington Oil & Refining Co., Ltd., Long Beach	4,000
Elm Oil Co., Ltd., Long Beach	1,500
Envoy Petroleum Co., Long Beach	3,000
Estado Petroleum Corp., Ltd., Long Beach	6,000
Exeter Oil Co., Bynes	10,000
General Petroleum Corp. of California, Lebec	12,000
General Petroleum Corp. of California, Vernon	30,000
General Petroleum Corp. of California, Torrance	35,000
Gilmore Oil Co., Los Angeles	1,500
Gilmore Oil Co., Roadamite	700
Golden Bear Oil Co., Ltd., Olildale	500
Hancock Oil Co. of California, Long Beach	15,000
Interstate Oil Corp., Taft	250
Kolingo Refining Co., Coalinga	225
Lake View Oil & Refining Co., Maricopa	3,000
Los Angeles Refining Co., Bandini	1,000
Macmillan Petroleum Corp., Signal Hill	7,500
McOwen, H. A., Refining Co., Long Beach	1,000
Mohawk Petroleum Co., Bakersfield	3,500
Monarch Refineries, Ltd., Venice	3,000
Norwalk Co., Maricopa	4,000
Olympic Refining Co., Long Beach	6,500
Paraffine Companies, Inc., Emeryville	1,200
Petrol Corp., Los Angeles	7,000
Rice Ranch Oil Co., Santa Maria	1,000
Richfield Oil Co. of California, Watson	40,000
Rio Grande Oil Co., Vinvale	10,000
San Fernando Refining Co., Newhall	2,000
Seal Beach Oil & Refining Co., Seal Beach	2,500
Seaside Oil Co., Ventura	5,000
Shell Oil Co., Coalinga	3,500
Shell Oil Co., Martinez	36,500
Shell Oil Co., Wilmington	35,000
Socal Oil & Refining Co., Huntington Beach	3,000
Standard Gasoline Co., Taft	1,500
Standard Oil Co. of California, Bakersfield	25,000
Standard Oil Co. of California, El Segundo	100,000
Standard Oil Co. of California, Richmond	100,000
Walter Steiner Refining Co., Long Beach	1,500
Sterling Oil & Refining Co., Bell	1,500
St. Helens Petroleum Co., Ltd., West Whittier	4,500
Super Asphalt Products Co. (Italo), Long Beach	1,500
The Texas Co. (California), Fillmore	4,000
The Texas Co. (California), Los Angeles	30,000
Triangle Oil & Refining Co., Ltd., Venice	3,000
Union Oil Co. of California, Maltha	5,000
Union Oil Co. of California, Oleum	17,000
Union Oil Co. of California, Santa Paula	1,200
Union Oil Co. of California, Wilmington	51,000
Western Oil & Refining Co. (Nevada), Wilmington	12,000
C. A. Williamson, Artesia	400
Wilshire Oil Co., Inc., Los Angeles	20,000
Total	762,650

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As a result, throughout the oil fields of the world UNION Lines are proving to be perfectly fitted to the special requirements of each job and of such uniformly high quality as to enable users to achieve minimum wire rope cost. In the Midcontinent oil fields of the United States they have steadily forged to leadership in sales volume. In the oil fields of Mexico, South America, and throughout the world, they are rapidly advancing in favor.

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The "ULTIMATE LOW COST WIRE ROPE"

Elwood Field Is Unique With Multiple Drilling From Heavy Foundations

By R. A. BROOMFIELD, JR.
Vice President, Barnsdall Oil Co. of California

Elwood—the Pacific Coast's seven-year-old oil field—the field that has produced some 50,000,000 bbls. of oil since its discovery on July 26, 1928. This is the number one field of the coast, and No. 4 in the state on a barrels-per-acre basis. To date, some 125,000 bbls. have been produced for each known acre of proven land. Practically all of this has come from the Vaqueros or lower Miocene measure. Exploratory tests into the lower or Sespe sands have not been sufficient to allow for an accurate forecast of the total number of barrels that may be expected to be recovered from these measures. The average recovery per well, including dry holes, has been some 350,000 bbls.

Little wonder it is then, that many innovations have been introduced into the oil business in the effort to develop and produce the high gravity and valuable oil that this field has yielded.

When the field was discovered by Barnsdall-Rio Grande's No. 1 Luton-Bell, from a total depth of 3,208 feet, for an initial production of 1,755 bbls. per day of 37.8 gravity, every acre of land in sight became valuable. It would be recalled that 1928 was one of the so-called boom years of the industry. Oil companies and landowners alike plunged into a mad scramble. Lawsuits ensued. Some of these lawsuits, involving landowners, and heirs of former landowners, are still in the courts.

It seemed that nearly everyone wanted "in" on this "wonder-field." It was not long before it became certain that, approximately, half of the field was to lie in the Pacific Ocean offshore from the mainland, the wells were to be comparatively shallow, the oil of a valuable quality, and production large. No costs were spared in those first few hectic months when flush production was bringing an oil field to its height of full glamour.

Those who had no access to the tideland permits off the mainland paid large sums of money to barges and ships to come in from the open sea, and actually drill their wells without ever touching dry land. In some instances, the drilling crews were even housed and fed aboard ships.

As more drilling ensued, the structure became more definitely defined—wells continued to come in for greater flush production; some of them went as high as 14,000 bbls. per day on a potential test. And then the dry holes began to show their faces in the picture.

The operators and their engineers realized that soon the initial production would be smaller, and that on a return-per-barrel basis, the relative costs would be higher. Like practical oil men usually do, the operators began to get together. They consummated their first joint venture, and today most of the operators in the field enjoy the use of the bulkhead road originally constructed by the Barnsdall-Rio Grande combination at the base of the bluffs. For the most part this road was carved out of the bluffs, and perhaps represented the first engineering achievement in the field, which has operated to reduce costs and save money to all the operators participating.

No Protection From Elements

The companies still had their problems. The locations in the ocean called for drilling in deeper and deeper water. Conditions were different than had been encountered in other parts of the country in marine oil well drilling. The ocean at Elwood was practically a part of the high seas, and was in no manner protected by any coves or inlets. The elements of nature battered their full array of oceanic disturbances against each well and its foundations, and as the locations approached deeper water, engineering practices called for radical changes and improvements.

When the ocean wells were first started, the engineers came up with several types of foundations—coffer dam type, five-legged caisson type, and multiple leg type. On account of the depths of water being encountered all of these types have been improved upon and changed from time to time.

The question of approach piers was vital and the construction of the piers themselves was expensive. Gradually pier design and pier construction has improved to where today they are practically all steel, with the exception of the plank roadways on top. At the present time these piers extend as far as half a mile into the ocean, and represent the finest and latest type of marine pier construction.

Figures soon revealed that it cost as much or more to build a foundation and erect the derrick on one of these deep water jobs as it did to drill the well and bring it on to production. Here again the companies went to work. The answer seemed to lie in two directions: First, improved and less expensive foundations, and second, multiple drilling and producing from the same, or tandem locations.

One of the engineers figured that with a 100-mile-per-hour wind velocity, with a full stand of drill pipe, and 122-foot steel derrick, and with a 200-pound per square foot wave pressure against the surface exposed on the multiple column foundations, there was a total over-turn moment of 11,200 foot-tons. The same 122-foot steel derrick with the same full stand of drill pipe would offer a total over-turn moment of 765 foot-tons on a land location. This example is mentioned just to show the magnitude of the problems facing operators.

General view of the Elwood Field, in Santa Barbara County, California

Perhaps, the most radical change in marine foundations was produced by Barnsdall-Rio Grande's marine engineer, Lawrence Collins. His answer came in his improved stabilized foundation upon which the U. S. Patent Office issued its letter of Patent No. 1,868,494.

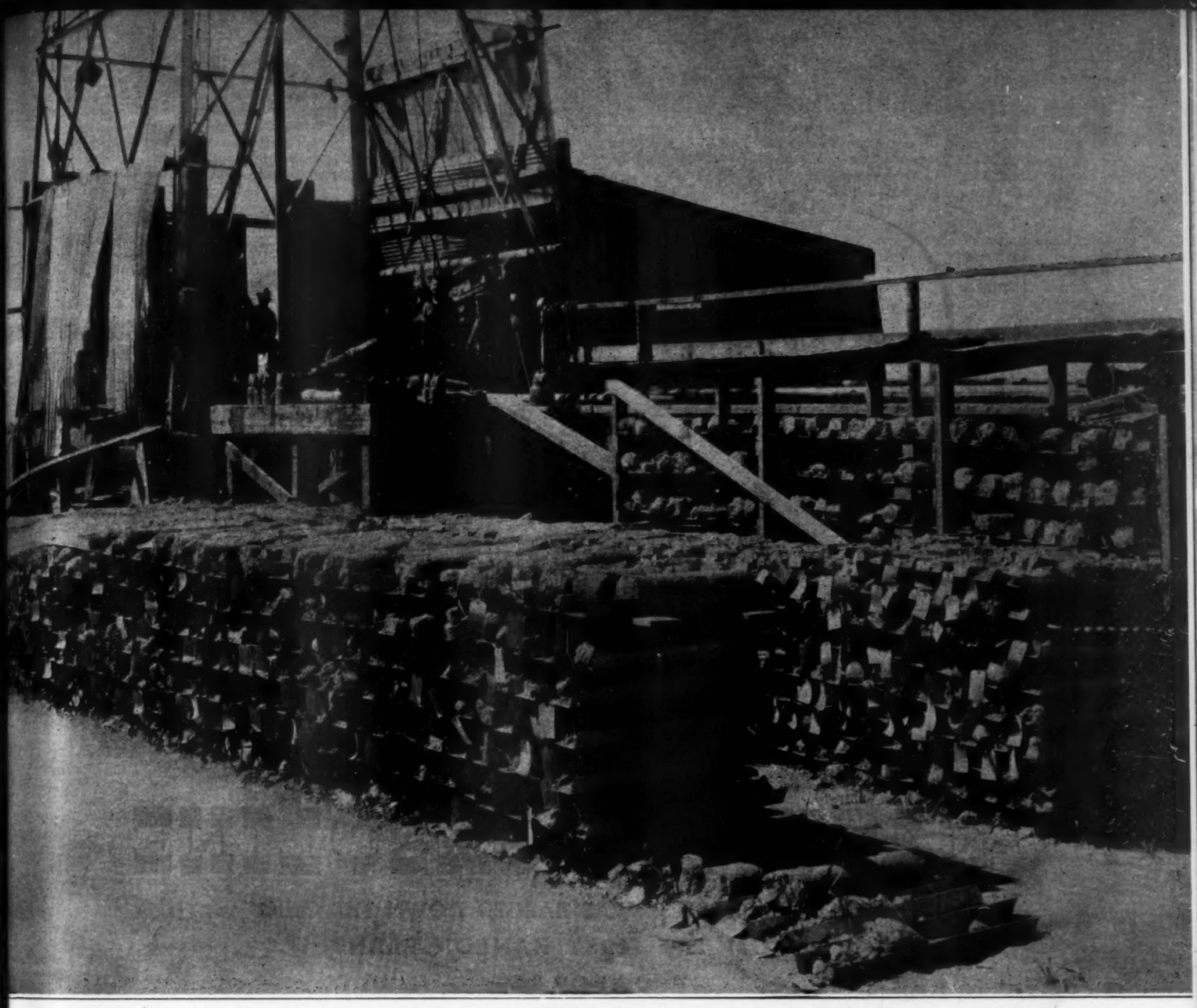
This new foundation came in three parts: First, a central column, 19 feet in exterior diameter, which was poured into solid shale well below the turbulent surface of the waves. In 40 feet of water this column has an allowable working bending moment at the level of the sea bottom of 18,000 foot-tons with a factor of safety of five. This 18,000 foot-tons answer is to the same problem described above with the 122-foot steel derrick, a full stand of drill pipe and 100-mile-per-hour wind velocity.

Part 2 of the stabilized foundation was a stabilizer itself, which is an immense concrete ring, that is poured into the floor of the ocean around the outside of the main column. Usually, this stabilizer is some 40 feet in diameter.

Part 3 of this setup is the foundation top for the derrick. The derrick floor itself is a large fireproof reinforced concrete slab, under which the operator can stand in a special access tunnel to operate the control valves. The cellar itself is some 20 feet deep and 10 to 11 feet in diameter.

This new stabilized foundation contains some 3,400 tons of materials. This can be compared with the old style five-leg foundations, which contained some 4,100 tons. These figures indicate that a saving in the cost of materials alone of some $12,000 is effected on the new style structure. In addition, substantial reductions have been made in labor costs.

And what is more interesting is the fact that



McCowan No. 13-1 Rig of A. T. JERGINS TRUST, near Bakersfield, California.

CORE SHOE

CATCHER SEATED IN SHOE

RESULTS—NOT THEORY

IN THE ABOVE PHOTOGRAPH WILL BE SEEN SOME CORES TAKEN BY THE ALCO CORE BARREL, USING THE DRAPER PATENTED CORE CATCHER.

DATA:

Cored 317′ to 1081′ with 15″ Alco Core Shoes.
748′ cored; 618′ recovered. Per cent, 82.
Average length cored, 20.8′. Average length recovered, 17.1′.

Cored 1084′ to 3192′ with 10⅝ Alco Core Shoes.
2111′ cored; 1653′ recovered. Per cent, 78.3.
Average length cored, 20.1′. Average length recovered, 15.6′.

Cored 3192′ to 3755′ with 7⅞ Alco Core Shoes and a well-known Rock Core Barrel.
260′ cored; 141′ recovered. Per cent, 54.2.
Average length cored, 9.3′. Average length recovered, 5.0′.

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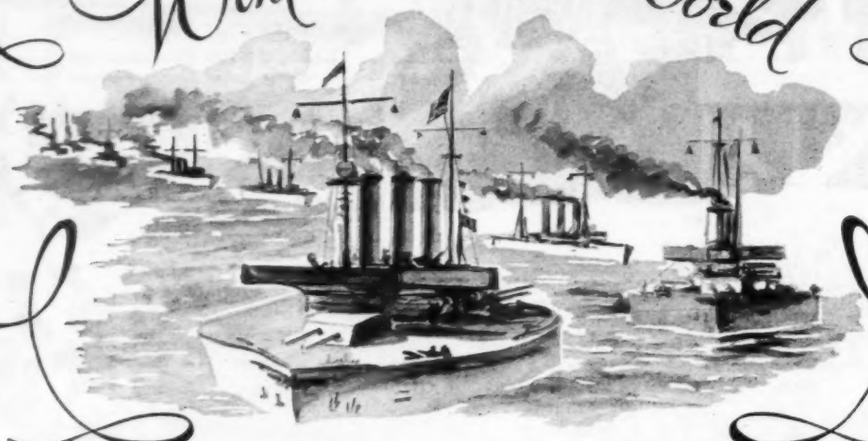
WHEN THE FLEET
Went Round the World



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the foundations themselves are not a part of the pier. No permanent tie is permitted between the piers and the well foundations. Some of the storms at Elwood have been pretty fair sized disturbances, and larger ones may be expected in the future. For this reason, a clearance of 4 inches has been maintained between the outer edges of the foundations and the pier itself.

Multiple Drilling

It was from this stabilized, single column foundation that the first multiple drilling was done by Barnsdall-Rio Grande. But before such drilling was done, the methods and apparatus for drilling a multiple number of wells from one foundation in the ocean, were covered in application for U. S. Patents, and issued under Patents No. 1,900,163 and No. 1,900,164, on March 7, 1933, to Drexler Dana and Frank A. Morgan of the Rio Grande Oil Co., with which company the properties at Elwood were being developed by Barnsdall.

On October 31, 1932, No. 88-9 State Lease well was spudded in. This was the first well which was planned to be a unit of a multiple number of wells to be drilled from a single foundation by Barnsdall-Rio Grande. On this hole every step was carefully planned in advance, even down to the details of eventual pumping of the wells.

The above described single column stabilized foundation was erected in the usual manner, except that a 49-inch conductor pipe was set in shale 76 feet below the floor of the derrick when the foundation was constructed. The top of this 49-inch conductor pipe was 20 feet below the derrick floor in the basement of the cellar. The usual practice called for setting 32-inch conductor pipe.

Before drilling was commenced a wooden form was constructed, which would hold a stand of 18⅝-inch surface casing, in the southwest side of the 49-inch conductor pipe. This 18⅝-inch casing was welded together, 79 feet of it was driven 2 feet into the shale through the wooden form on the southwest side of the conductor pipe. This means that the bottom of the 18⅝-inch was at 81 feet below the derrick floor. The top of it was then drawn over it towards the drawworks to form an inclination of 4¼ degrees from the vertical. The rotary table was placed in the center of the derrick and 2 feet towards the drawworks but the crown block and the drawworks were set in their normal positions. This allowed the top of the 18⅝-inch to line up with the center of the table. The first 178 feet of hole was drilled with 6-inch drill pipe and 17¼-inch bit with the full weight on the bit.

Drilling was stopped at this point and the 18⅝-inch casing was pulled over so that it lined up with the center of the four derrick corners, and the rotary table was moved back to the normal position. For the next 322 feet, that is to say down to 500 feet, the same 17¼-inch hole was carried, at which time 13⅜-inch casing was cemented in place.

The 13⅜-inch casing was pulled from against the 49-inch conductor pipe, in line with and 1.10 feet from the center of the derrick on the opposide of the drawworks, after the 18⅝-inch casing was stripped off. The 13⅜-inch was then clamped to two 20-inch "I" beams, which had been set at right angles to the pier lines. The "I" beams were so constructed that additional beams could be bolted on at right angles for the two additional wells should they be drilled in the future.

Summerland Pool in California

The rotary table and crown block were then moved from their normal position to a point 1.10 feet away from the drawworks, which would center them directly over the 13⅜-inch casing. This movement made the 13⅜-inch casing vertical for the first 78 feet.

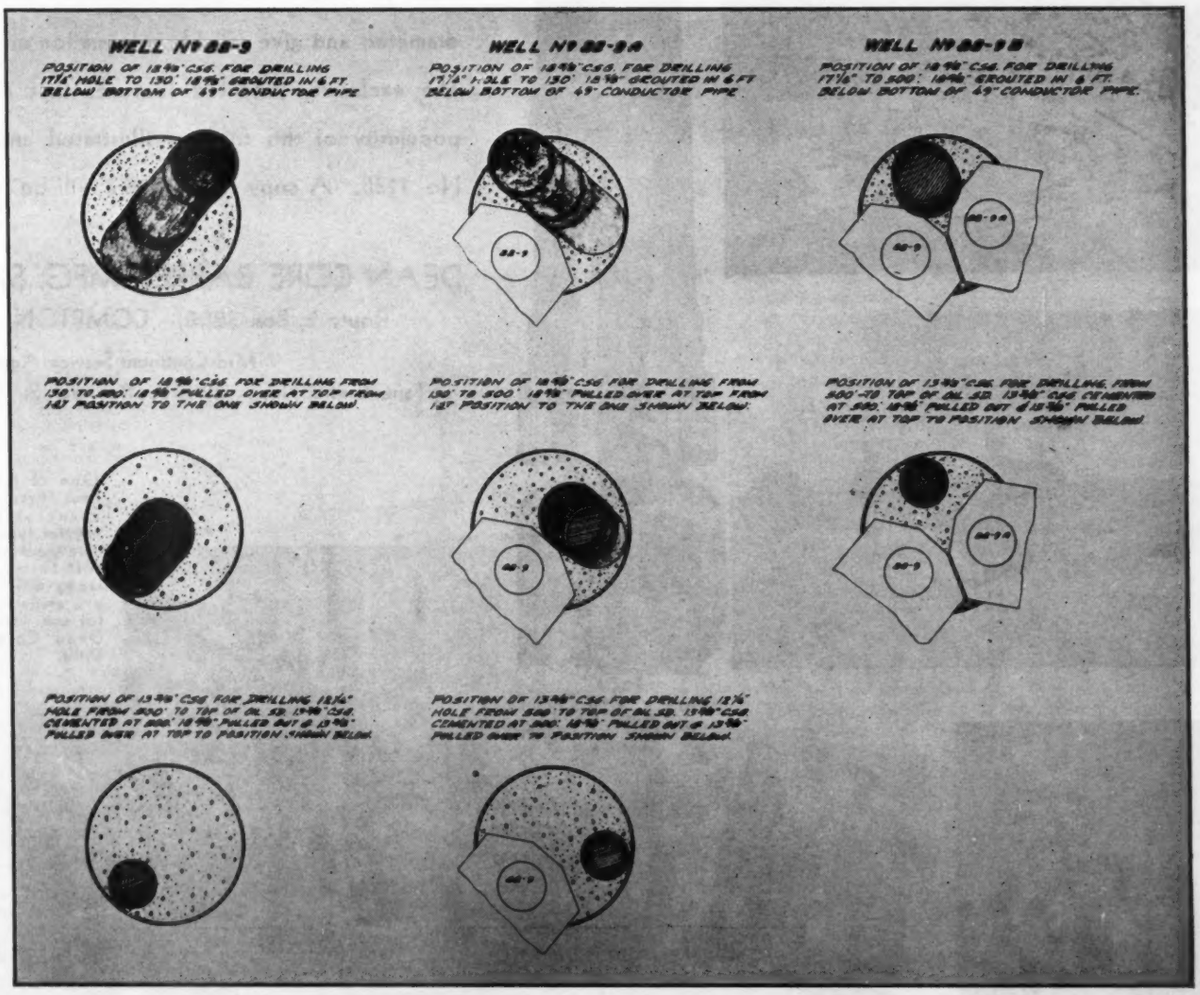
From 500 feet on, the hole was drilled to the top of the Vaqueros sand, and the usual string of 10¾-inch casing was cemented. In order to conserve space, the 10¾-inch was landed immediately on top of the 13⅜-inch. After deepening into the producing zone and running the liner and tubing in the usual manner, a temporary christmas tree was set on the derrick floor until the well was proven productive.

It was some time later, in June of 1933, that the second well was started from the same foundation. The well was to be known as No. 88-9A. A hole was cut, measuring 6"x20" through the 4-foot thick cellar wall and foundation in such a manner that it would line up with the tubing head of No. 88-9, and would clear through the "H" beams in the foundation, and allow room for drilling the other two wells. Four-inch lines were run to the tubing and casing in order that the well could be flowed either through the tubing or casing. These lines ran to a platform outside of the well foundation, which had 7 feet of clearance between the bottom of the derrick floor and the top of the platform. It was on this platform that the christmas tree was constructed for this well, and upon which the flowing devices for future wells were to be constructed.

Drilling of Second Well

On June 25, 1933, No. 88-9A State Lease was spudded in by driving the same 18⅝-inch stand of pipe as was used in No. 88-9, except that it was driven 3 feet into the shale. The bottom of the 18⅝-inch was in the position 0.6 foot towards the drawworks and 1 foot to the left from the center of the derrick floor. The top of the 18⅝-inch was then pulled over in a northwesterly direction and clamped parallel to and against the side of the 20-inch "I" beams that were used in landing No. 88-9.

The inclination of the 18⅝-inch at this point was about 2 degrees. The rotary table was skidded 0.60 foot towards the drawworks and 1.80 feet to the right from the center of the derrick; the drawworks was moved 1.80 feet to the right to its normal position. The crown was then moved 0.6 foot towards the drawworks. From this position to 156 feet, the hole was drilled with a 17¼-inch bit, with all the weight on the bit. During all



Arrangement for drilling three wells at Location No. 88-9, Elwood Field. Horizontal section 2 feet below derrick floor

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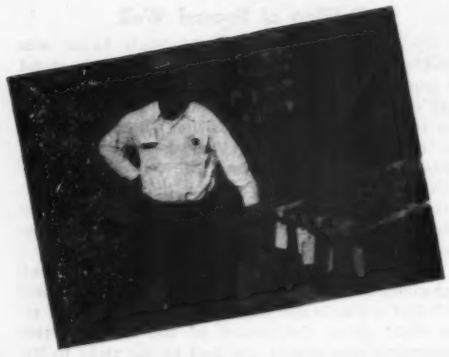

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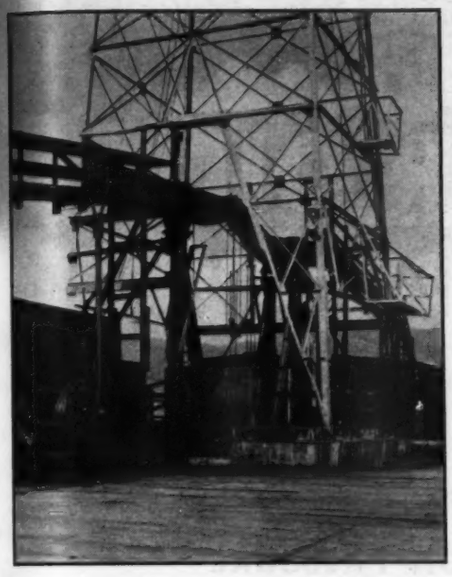
of this time No. 88-9 was in a producible condition but was kept shut in as a safety measure against the possibility of fire.

The top of the 18⅝-inch was then pulled over so that it would line up with the center of the derrick at a point 0.60 foot toward the drawworks. The rotary table was then moved from the center of the 18⅝-inch and the drawworks were jacked back to normal position. From this point the hole was deepened to 500 feet where 13⅜-inch was cemented and the 18⅝-inch was stripped off as before. The top of the 13⅜-inch casing was drawn over to final position and clamped to the same 20-inch "I" beams as used for No. 88-9 on one side and 8-inch "H" beams on the other side. The position of the 13⅜-inch was such that the center was 1.20 feet to the left and 0.6 foot towards the drawworks from the center of the derrick. The crown, drawworks and rotary table were moved



Two pumping wells under same derrick

1.20 feet to the left of the center of the rig. From here the well was drilled to the top of the Vaqueros sand and 10¾-inch casing was cemented and landed on top of the 13⅜-inch. The well was deepened into the oil sand, the liner run and tubing hung, the same as in any ordinary well. Another hole 6"x20" was drilled from the concrete foundation, and the 4-inch lines from tubing and casing were brought out to the christmas tree on the platform, and the well was completed.

Third Well Is Started

It was on February 24, 1934, that the third well was started from this same foundation. This well was known as No. 88-9B. At the start the 18⅝-inch conductor pipe was driven into 3 feet of shale with the bottom against the side of the 49-inch pipe, and with 13 feet of 4-inch offset at the bottom of the 18⅝-inch. The angle of inclination at the beginning was 1 degree 45 minutes. The crown was moved 0.6 foot toward the drawworks and 0.75 foot to the right from the center of the derrick. The drawworks were skidded 0.75 foot to the right. From 76 feet to 500 feet, the hole was drilled with 17¼-inch fishtail bit and reamers.

The usual 13⅜-inch casing was cemented at 500 feet and the 18⅝-inch was stripped off. Again the top of the 13⅜-inch was pulled into its final position against the 49-inch with the center 1.10 feet to the right and .60 foot toward the drawworks. It is here that this was clamped in place. With all three holes now started the 49-inch casing was filled up with cement to the bottom of the cellar. The well was finished in the Vaqueros sand after moving the crown block, rotary table and drawworks to their respective positions. The well was completed and the flow lines taken out to its christmas tree on the platform.

The three wells, afterward completed, formed an isosceles triangle, with one well in the center of the derrick and the other two equi-distant from the center, and 2 feet apart.

When it came time to pump these wells, it was decided to pump each well with a separate unit. A samson post for one unit was set out further from the edge of the foundation than is the usual practice. The other two samson posts were built together on the opposite side of the derrick floor with 3½-foot centers. This allowed 4 feet of clearance between the wrist pins and a 72-inch stroke when the crank was horizontal and the wrist pins nearest the polish rods.

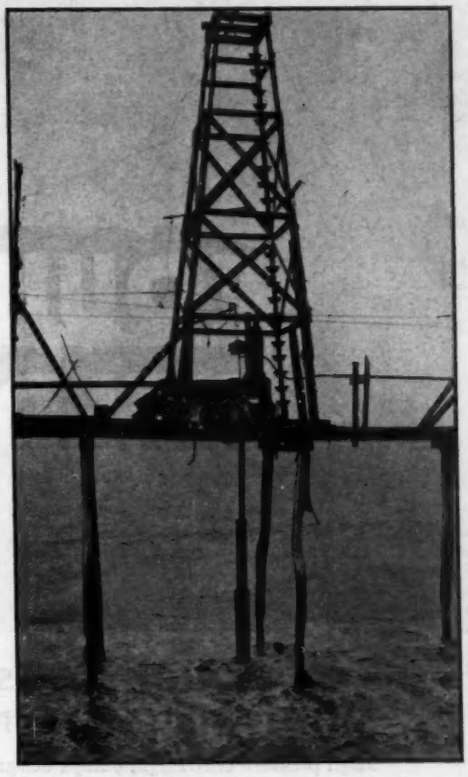
Having each well pumped by its individual pumping unit means that the length of the stroke and the speed of pumping can be regulated on each well.

After three wells were completed from the No. 88-9 location, it was decided to drill another well from the No. 88-8 location. A slightly different procedure was followed in drilling No. 88-8A. No. 88-8 State Lease well already had been drilled as a normal well under normal conditions. The well had been completed in one of the above mentioned single column, stabilized foundations, which had a cellar 10 feet in diameter.

Well 88-8 had a 32-inch conductor pipe, with a 16-inch surface string set inside the 32-inch. Between the 16-inch and 32-inch, cement had been placed to within 76 feet of the derrick floor. From this point to the derrick floor, the space was filled with sand. Before starting work on No. 88-8A, this sand was jetted out and the 16-inch surface string of No. 88-8 was pulled over to the right of the drawworks and tied in place.

A portion of the 32-inch conductor pipe was cut out for 12 feet below the cellar floor and a straight piece of sheeting put in its place. A portion of the concrete forming the walls of the cellar was mined out with air hammers to 20½ feet below the cellar floor. In addition to the already completed No. 88-8 well, two additional wells were planned, so two stands of 18⅝-inch conductor pipe were placed in the drilled out section of the cellar wall and cemented in place at 2½ degrees inclination. The projection of these 18⅝-inch pipes would place them 14 inches from the center of the derrick at the top of the rotary table. After this was done, the 16-inch surface casing of No. 88-8 was cemented in its new place inside the 32-inch.

On September 24, 1934, drilling commenced on No. 88-8A. The drilling was through one of the 18⅝-inch casings into the concrete wall of the foundation. It was necessary to hold the kelly at a 2½ degree angle, and in order to supply more weight, two 1-ton chain blocks were employed to exert a downward pull on the drill stem. The initial drilling in the concrete was at the rate of 6 feet per hour, and then 10 feet per hour with rock bits. Following the 2½ degree inclination, the bit went to 110 feet before going out of cement. From



Well at Summerland, California

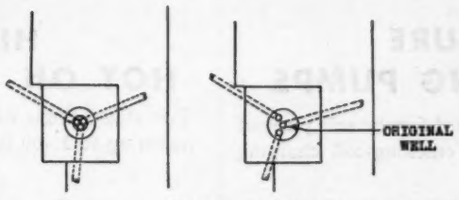
that point on, the drilling methods, and the methods of completing the well were substantially the same as mentioned in the drilling of the wells on No. 88-9 location.

However, it is now thought that when, as, and if, any more wells are drilled from foundations now containing only one well, which was not originally planned as a multiple well location, it will not be necessary to go to the expense of mining out with air hammers such a large portion of the concrete side walls of the cellar. Company engineers believe that 1 foot of fining in the cement would probably be all that is necessary. It is pointed out that the cutting and mining process on Nos. 88-8A and 88-8B locations consumed nearly two weeks' time.

When No. 88-10 State Lease well was drilled a different procedure was followed as far as the well foundations are concerned. No. 88-10 was drilled from the foundation built in tandem to No. 88-1 well. Well No. 88-1 is producing from the Vaqueros sand and No. 88-10 was completed in the lower or Sespe sand.

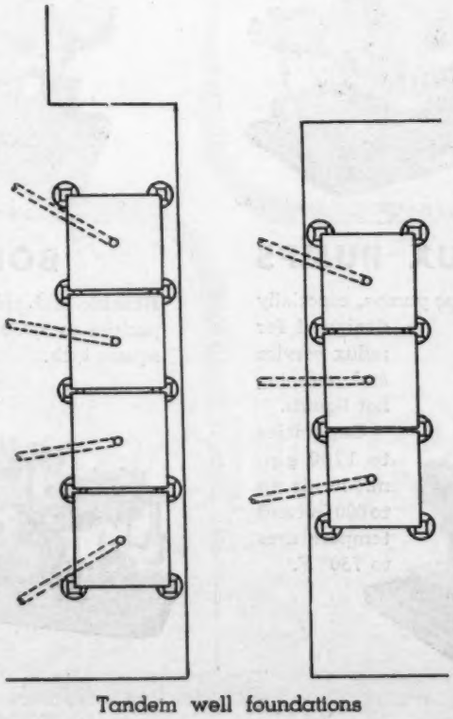
The above examples have been given as typical problems in multiple well drilling at Elwood on the part of Barnsdall-Rio Grande. Other operating companies at Elwood are using similar procedure, but as far as well foundations go, have stuck more closely to the tandem type of foundations. In the tandem type two corners of a well foundation are utilized for two corners of the adjacent foundation. The foundation piles and legs are so tied that they really form one foundation unit, and from a structural standpoint really represent strong marine construction.

In any of the above operations, the extensions of piers and building of strictly individual foundations would have cost an additional enormous sum of money.



Three well foundation

Single well location revised to accommodate two additional wells



Tandem well foundations

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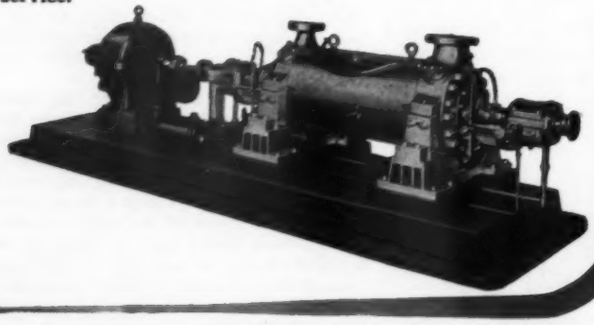

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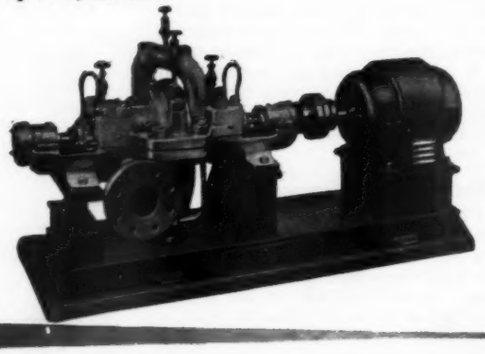

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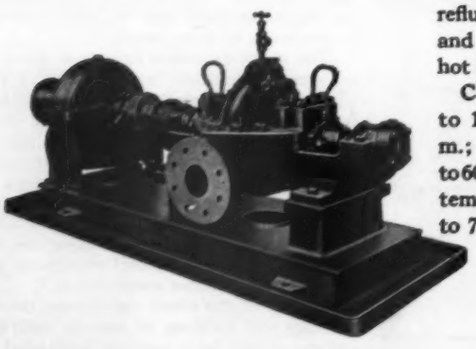

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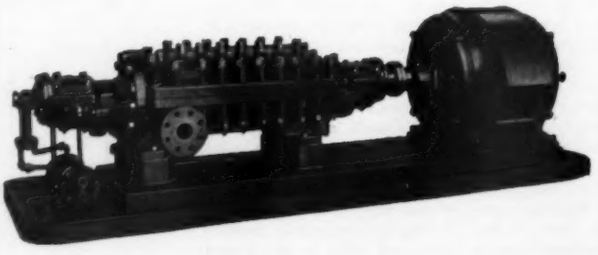

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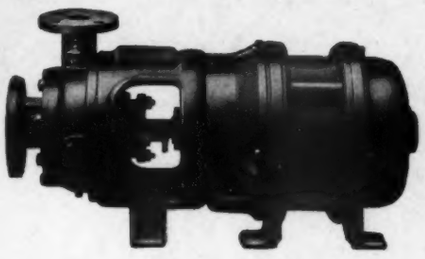

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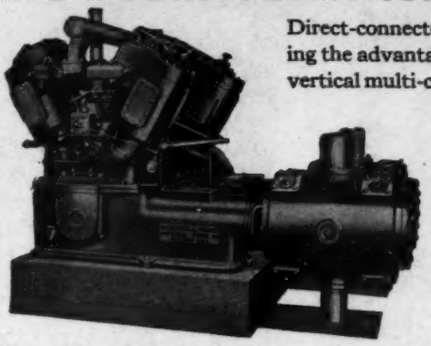

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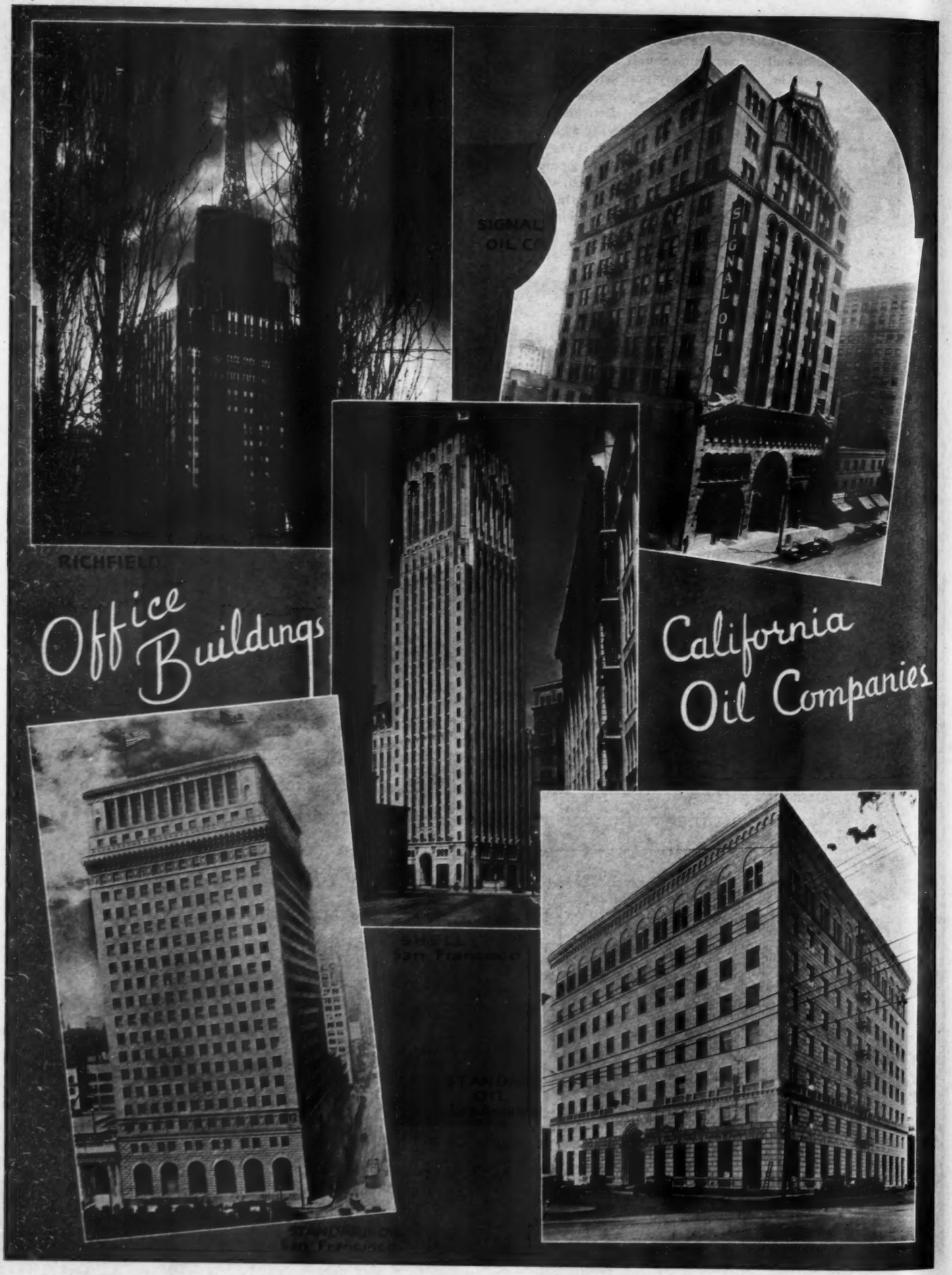
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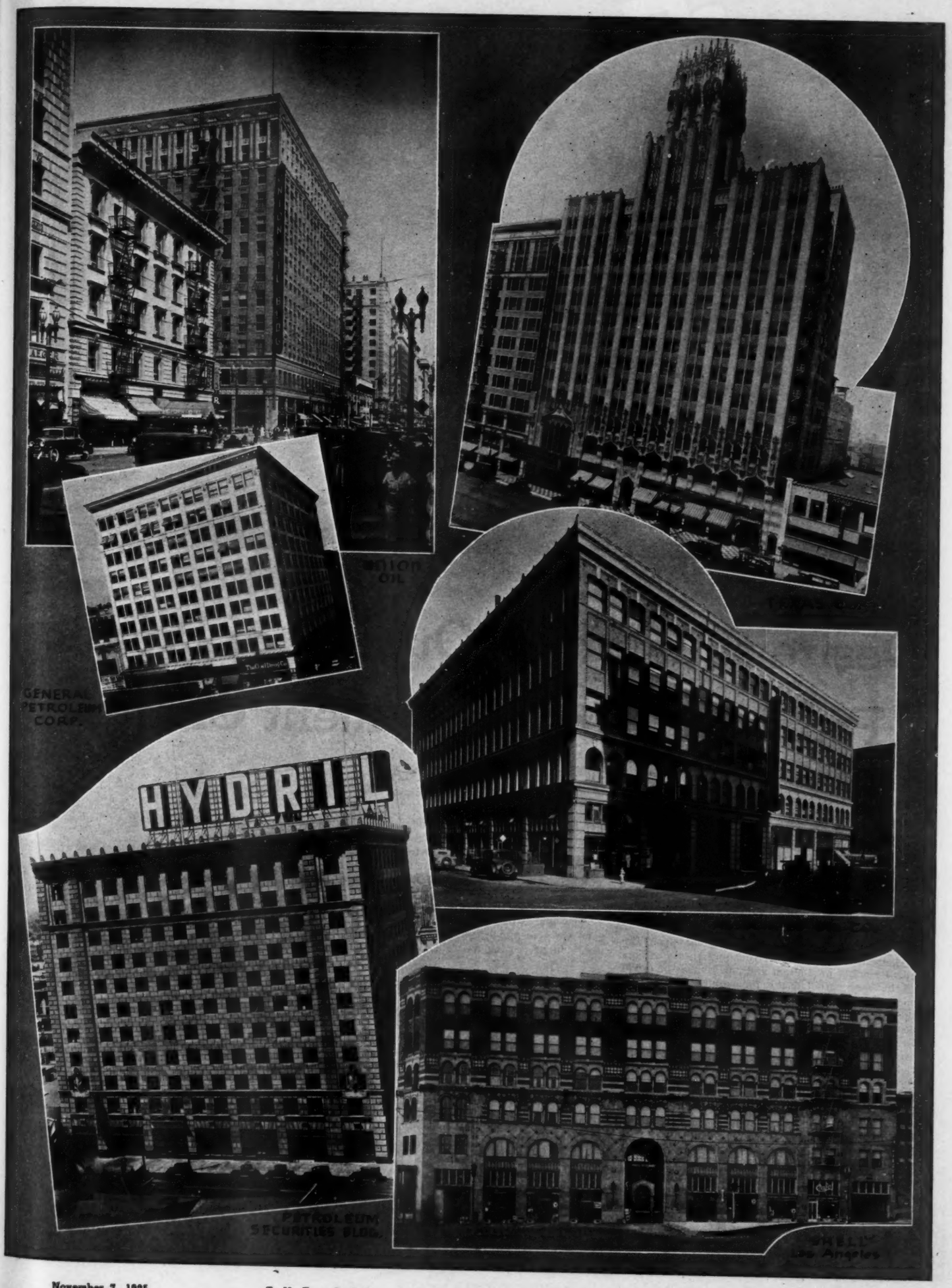
HYDRIL

Interior view of an Edeleanu oil treating plant for processing kerosene to reduce the sulfur content of the oil

Desire to Improve Quality of Products Prompts Plant Equipment Changes

By L. MITTELMAN
Associated Oil Co., San Francisco, Calif.

Refining in California, measured by accomplishment, is not materially different from refining elsewhere. Progress has been more or less universal. There is a difference, however, in procedure brought about by localized conditions such as available types of crude, production changes and marketing requirements which probably justifies consideration from this viewpoint.

Cracking operations are dependent upon the preponderance of residual fuel and rarely on gas oil. Receding production and curtailment of crude oil have accentuated the importance of cracking more for the maintenance of gasoline quotas and the utilization of surplus fuel than for the original need of antiknock characteristics by this method. In marketing, no one need doubt that activities over a period of many years have established a field in the domestic and export trade for low cost California lubricants and that recent trends have shown paralleled activities toward quality lubricants. What is true of lubricating oils is also true of gasolines, solvents, spray oils and fuel oils. Refining trends in California are showing distinct activity in the development of products for sales based on performance characteristics.

Progress in refining may be measured by several yardsticks. We usually consider the construction of new equipment to be the mark of progress but overlook the fact that somewhere in back of the engineering design there has been development and processing achievement which laid the foundation. We do this because of the concrete and visual display of progress that accompanies new and large scale construction and reason that one or more factors have been provided such as:

1. More adequate facilities to handle demand.
2. Reduced cost of manufacture.
3. Increased flexibility of manufacture.
4. Manufacture of new products.
5. Improved quality of products.

The story, however, is not entirely complete until we give ample consideration to the developments in processing as well. With this in mind,

Since building its first refinery in the state in 1876 California has been quick to adopt improvements in the equipment and methods of processing. In the accompanying article the author discusses some of the more recent refinery developments.

it is the purpose of these preliminary remarks to pave the way for enumerating, in a general manner, the progress of California refining from the standpoint of not only new and operating equipment, but also processing development, new products and the prevailing improvement in quality of existing products.

There is a wide gap between the art of batch distillation and the science of fractionation. The intervening years have produced the modern pipe still with its controlled temperature and contact time, the multiple plate fractionating towers with its reflux controls and auxiliary strippers, the carefully arranged heat balances for fuel economy and the innumerable gadgets for centralized operation and rate control. With these tools the refiner began to perform tricks with his distillates and each plate on his bubble tower became a new toy. This may sound too far fetched but let us see what has happened in our Pacific Coast area.

In motor fuels we found controlled fractionation, first in lower endpoint gasolines and then in the stabilization of front-end volatility. More attention was given to road performance particularly with reference to the climatic control for quick starting, warm-up, acceleration and freedom from vapor lock. Only very recently aviation-type gasolines have been introduced to the motoring public which combine the aforementioned features to a still more marked degree. In solvents we began to see narrower cut fractions in a variety of ranges. The list can be continued with propane, butane, distillate fuels, orchard spray oils and lubricating oils. Even with asphalts the effects of fractionation are apparent.

The importance of stabilization in eliminating the front-end components which cause vapor lock has brought about improved tower efficiencies and

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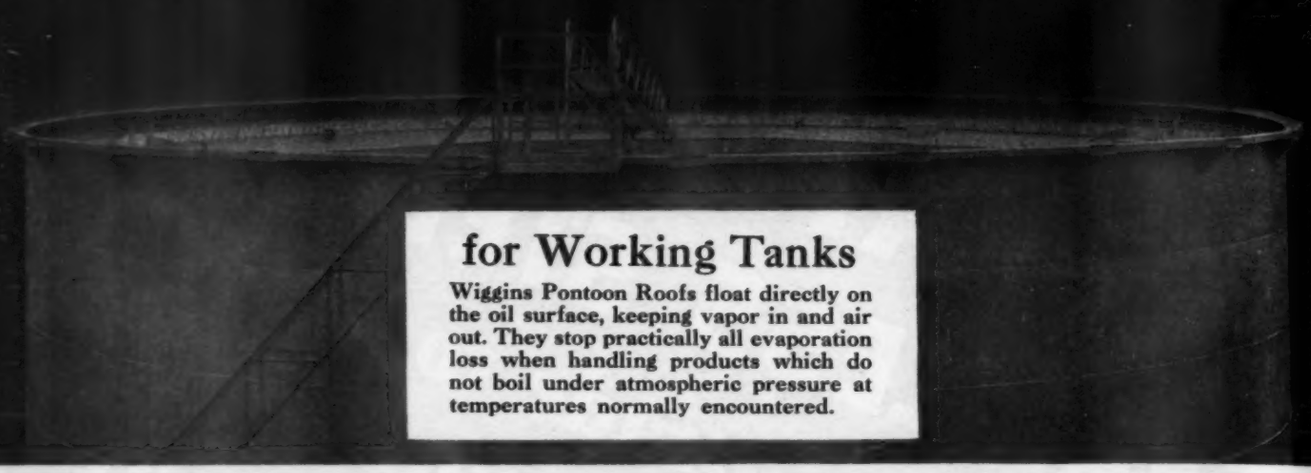

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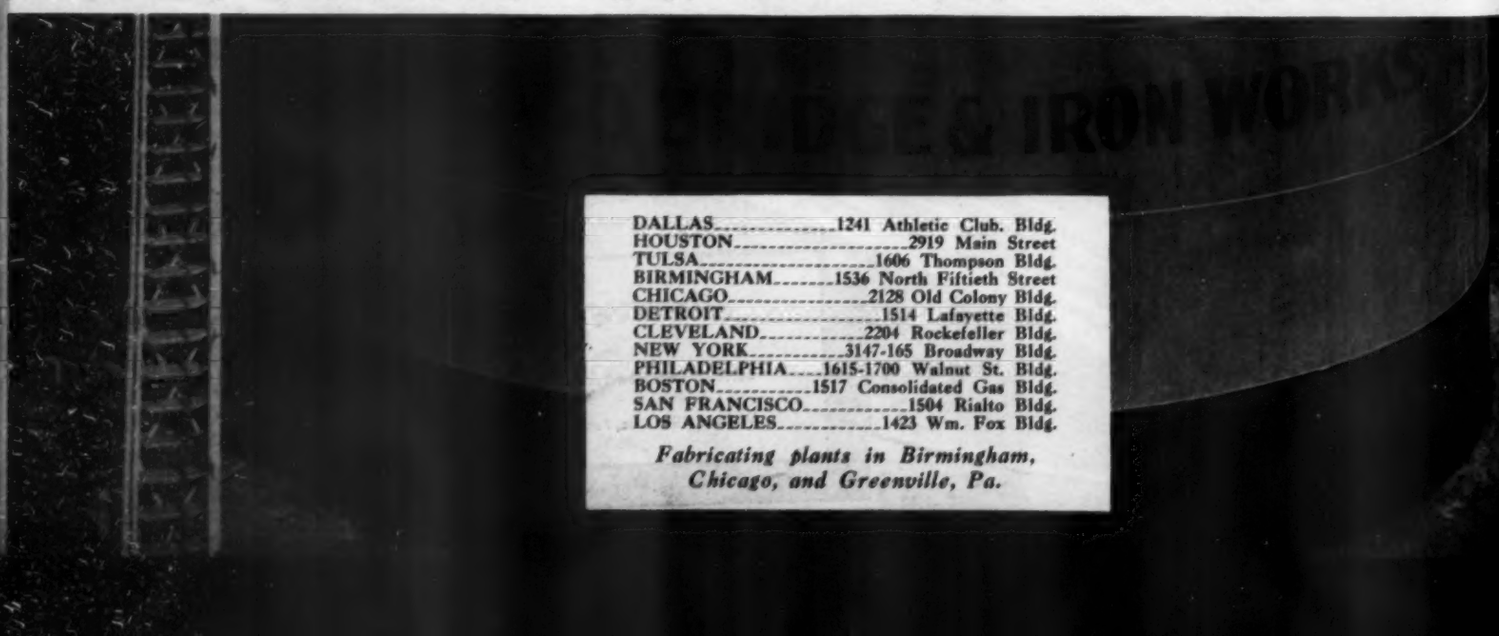

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Fabricating plants in Birmingham, Chicago, and Greenville, Pa.

a variety of auxiliary units for fractionating segregated portions of the distillates. To obtain gaps between overhead and bottom products from a fractionating tower is not uncommon and with the continual trends in this direction we may continue to see considerable further advancement.

There are about 60 refineries in regular operation in California with a combined daily charging capacity of 835,000 bbls. Owing, however, to economic conditions and the effects of curtailment less than 60 per cent of this capacity is being utilized and it is presumed that because of cost ratios the old and more obsolete equipment is idle while the more modern type is producing the quotas imposed by current trade demands. It might be interesting to note from a recent survey that the 114 pipe stills now operating in crude service have a daily charging capacity of about 450,000 bbls. and are probably handling the bulk of crude oil. Since pipe stills are usually associated with modern equipment it is reasonable to conclude that they are also accompanied by fractionating towers.

Recent installations can be seen in practically all of the established refineries. Also, several new units have been constructed within the last few months and, in particular, a combination atmospheric and vacuum crude unit of 21,000-bbl. charging capacity.

Cracking Operations

Cracking operations are very active in California. It is significant to mention that, while only about 60 per cent of refining facilities are in operation at the present time, practically all of the cracking equipment is being utilized. There are 17 plants in California equipped with about 70 operating units of various kinds with a total daily capacity averaging around 275,000 bbls. Tube and Tank, Cross, Dubbs, Holmes-Manley, Black, Sinclair and Clark are among the general types represented. We have units among those operating that have been completed during the present year. One, now under construction is a combination type skimming and cracking unit designed for 12,000-bbl. crude and 8,000-bbl. cracker charge.

There has been a decided tendency in the past three or four years toward the larger unit installation with large heating surface and greater flexibility. More consideration has also been given to waste heat utilization and corrosion resistant alloys.

Unlike general procedure in the Mid-Continent or Eastern areas, California cracking is almost entirely confined to the heavy fuel oils, there being an abundance of this material prevailing in our crudes. Cracking by direct charge, where cycle stock is combined with the fresh feed after it passes through the furnace is most generally employed. Combination units where installed consist of viscosity breaker and high pressure gas oil cracking unit rather than combination topping and cracking units. Surplus heavy fuel oils are partially converted into gas oil or cycle stock, a small amount of gasoline, and the balance made available as high quality low viscosity fuel oil. This procedure has shown merit because of the high fuel throughput and the segregation of the clean overhead portion for further cracking.

Refineries operating cracking units are continually confronted with individual problems that require solution to suit their specific circumstances. Changes in processing have come about gradually and without the spectacular display that so often accompanies other developments. Pressure distillates which were formerly wide cut and high endpoint products are now being fractionated as carefully as finished gasolines. Cuts are made for distinct endpoints and heavy ends eliminated to minimize the chemical treating operations and thus preserve most of the original antiknock characteristics. Similarly, gas oil charging stocks that result from viscosity breaker operations are being carefully fractionated to eliminate entrainment of fuel oil and prevent excessive carbonizing in the cracker tubes. Stabilizers and auxiliary strippers have been extremely important in eliminating the volatile front-end constituents. Stabilizer overhead products form the basic raw material for the production of butane, propane and unsaturated hydrocarbons used for chemical syntheses.

The gasolines produced by cracking are now far superior to those produced a few years ago. Distinctive improvement is observed in high antiknock characteristics and greater freedom from gums and unstable constituents. Present cracked gasolines are stabilized to eliminate vapor lock and also are fractionated to eliminate the high-boiling portions. In general, they have attained recognition as a quality type product. The fuel oils are cleaner, show negligible b.s.&w., and have a marked freedom from suspended carbonaceous material. Thus the products of the cracking plant are with us not only because of economic pressure but because they hold a recognized place in the standards of petroleum products.

Lubricating Oil Processing

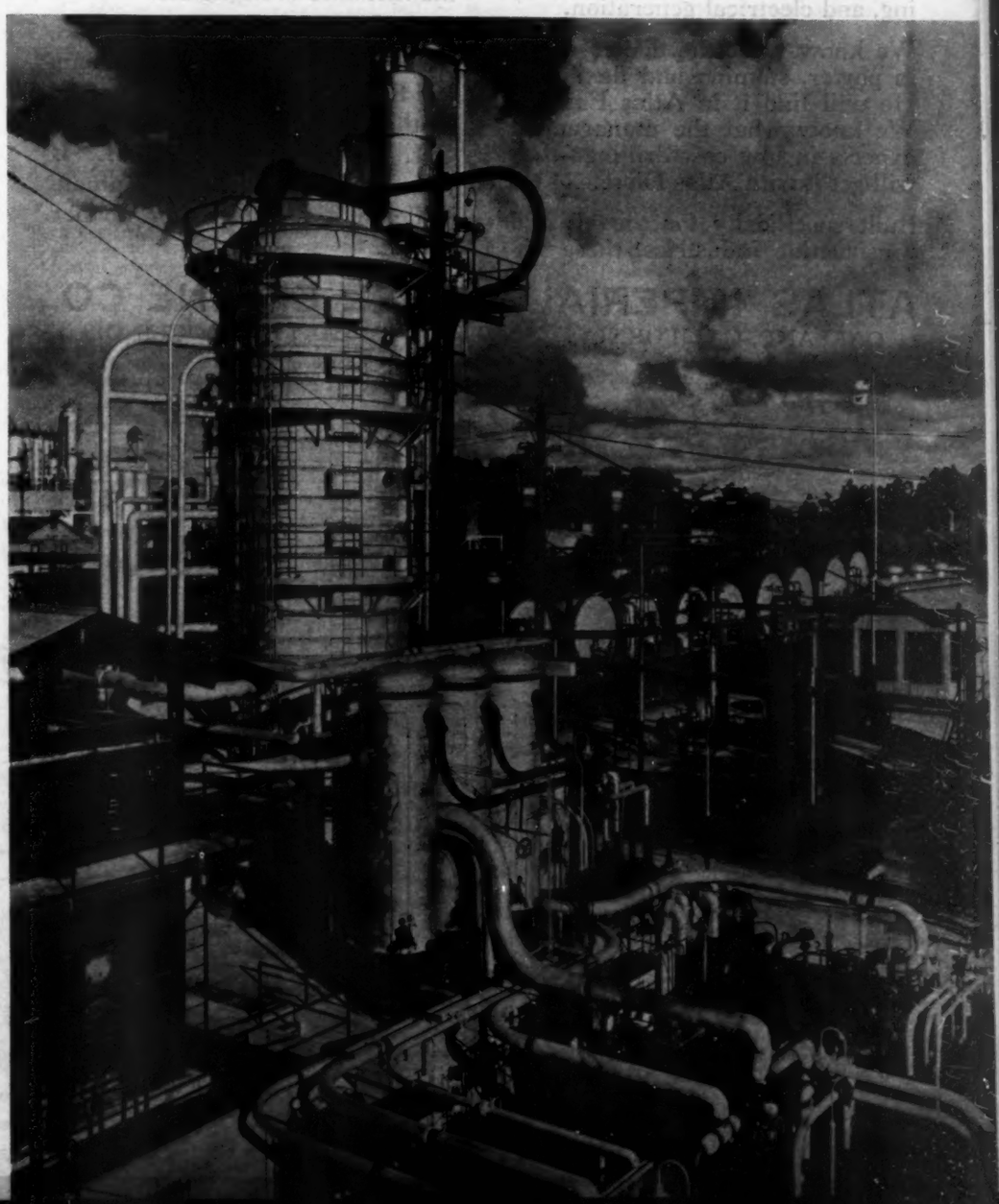
The common practice in the refining of California lubricating oils is to select wax free crude. Processing, particularly with major companies, has progressed from the old style steam distillation through batch stills to the modern pipe still and vacuum fractionating tower. This development has been of particular importance with western refiners because lubricating stocks are entirely the overhead distillates from the crude and need to be handled in a different manner than the eastern crudes. The separation of lubricating stocks, by distillation from crude oil, is essentially a deasphaltizing process where the elimination of entrained asphaltic material is highly important in aiding further treatment. Distillates are desired with a minimum of chemical change and the development of short time contact in pipe stills and the use of vacuum in fractionation has been a receptive innovation. Vacuum fractionating towers of very high efficiency were introduced as early as 1928 and improvement in design and operating procedure has been continuous. At the present time the bulk of California lubricants are produced by vacuum distillation.

Processes vary with different refiners, some treating narrow cut distillates and others a wide cut for subsequent refractionation. Coincident with solvent refining most of the newer lubricating oils presented to the trade are redistilled products. This double distillation has materially helped to improve the stability characteristics of western oils. These oils have always possessed the advantages of low carbon residue and low pour point.

Elaborate improvements have been underway within the last two years so as to increase the production of lubricating oils. Considerable money has been spent in the reconstruction of distilling facilities and other additional equipment necessary to meet the growing demands. A large outlet has been developed for the orchard spray oils which comprise the very light cuts removed from the lubricating stocks. While these light oils were originally removed for the primary purpose of improving the volatility characteristics of the lubricating oils, they now have become one of the major refinery products. It might be of interest to point out that California refiners have for some time been co-operating with the growers and with the State Department of Agriculture for the continued development of oils used in the control of orchard pests.

A further and distinctive development in the manufacture of California lubricants is the recent utilization of waxy crude where overhead distillates are being dewaxed by the use of liquid

Fractionator in the Oleum refinery of the Union Oil Company



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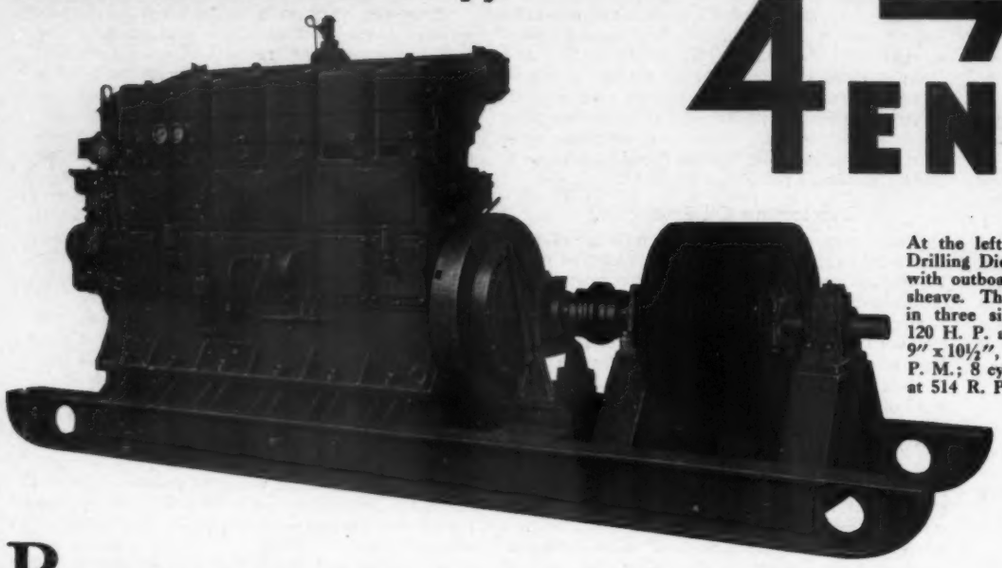

At the left is the Atlas Imperial Drilling Diesel, mounted on skids, with outboard bearings and V-belt sheave. These units are available in three sizes: 6 cyl. 7" x 8½", 120 H. P. at 650 R. P. M.; 6 cyl. 9" x 10½", 200 H. P. at 514 R. P. M.; 8 cyl. 9" x 10½" 275 H. P. at 514 R. P. M.

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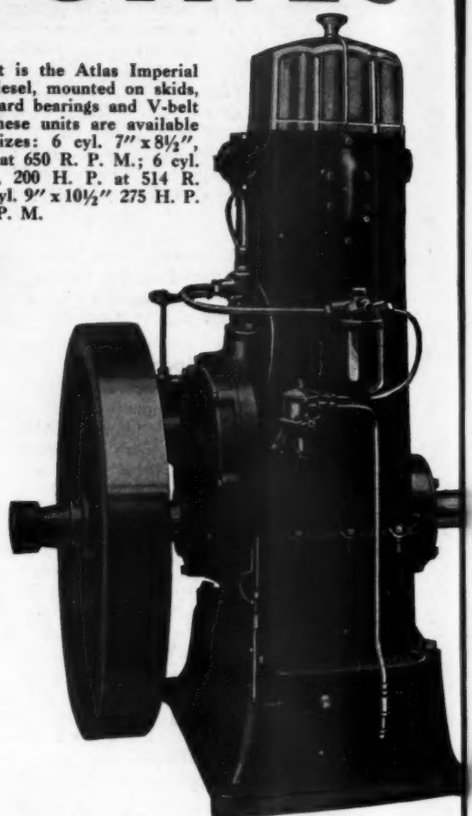

Above is a single cylinder, four cycle Diesel which may be had in either 5 or 10 H. P. sizes. The 5 H. P. engine has a 3⅞" bore and 5¼" stroke. It is rated 5 H. P. at 1000 R. P. M. at sea level. The 10 H. P. size develops its rated horse power at the same speed and has a 5" bore and 6½" stroke.

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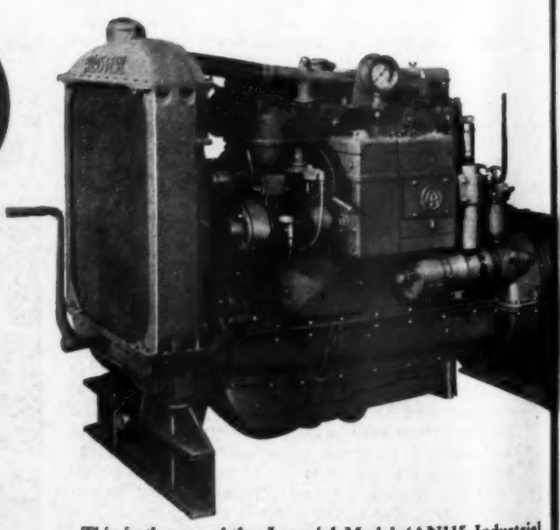
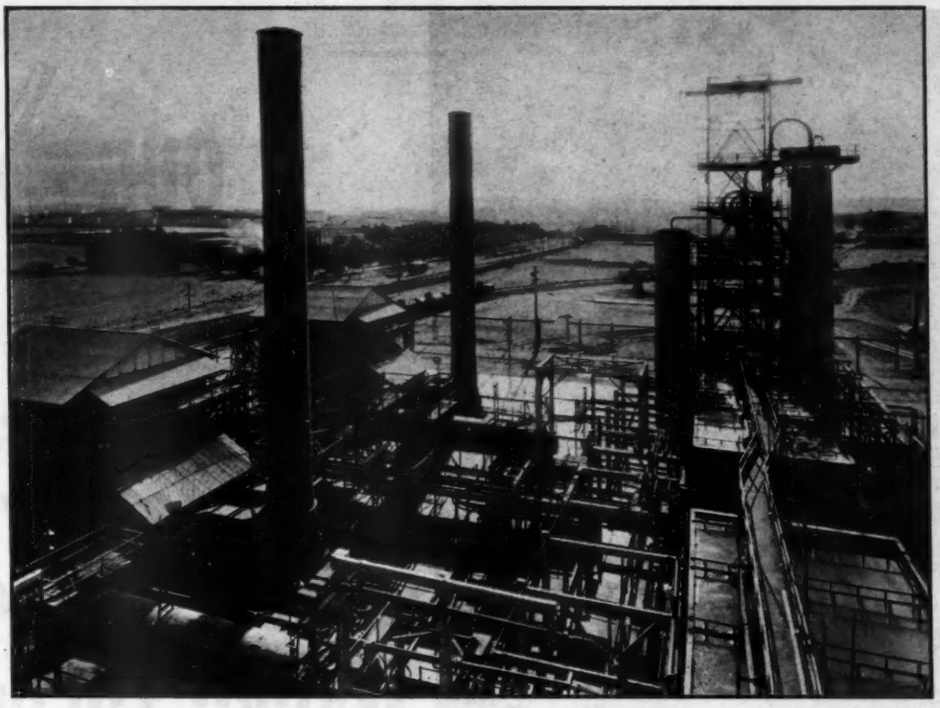


This is the new Atlas Imperial Model 4AN115 Industrial Diesel power unit. It is a four cylinder model of 4¼" bore and 6½" stroke, rated 40 H. P. at 950 R. P. M. This is a four cycle Diesel which incorporates the new Atimco fuel injection system. Furnished complete with skid mounting, cooling system, electric starter, clutch power take-off. Bulletin on request.

ATLAS IMPERIAL

propane. In this process the propane serves as its own refrigerant, cooling the oil to sufficiently low temperatures for the wax to settle out. This process deserves considerable commendation not only because of the newly opened source of lubricating stocks but also because of the engineering obstacles which it has been necessary to overcome. In the commercial adaptation of the process, alloys had to be found which would be capable of withstanding the strains at extremely low temperatures. The propane is also a deasphaltizing medium selectively dissolving the lubricating oil fractions. A certain amount of entrained asphalt is even removed in the treating of lubricating distillates. Its use is also applicable to the deasphaltization of residual stocks.



Cracking furnaces and fractionating equipment in a modern petroleum refinery

Solvent refining originated in California many years ago. As early as 1924 kerosenes were being processed by the use of liquid sulfur dioxide. Subsequent investigations carried on for a period of three years ultimately produced the first solvent refined lubricating oils in America. These included oils ranging from the very light grades to the heavy motor oils together with such products as transformer oil, cosmetic oils and spray oils. Shortly after this development, two additional solvent refining plants using sulfur dioxide were constructed and placed in operation. In recent years there has been, due to the widespread activities in solvent refining, an additional increase in this trend and a variety of other solvents are being used. One plant is now using the benzol-sulfur dioxide mixture, another is using liquid phenol. Since the entire country is solvent minded, many other processes are under investigation with other solvents and considerable progress is to be expected in this field. Solvents are selected to remove from petroleum, chemically active ingredients, hydrocarbons of high specific gravity and sulfur compounds. The oils thus treated show lower specific gravity and better viscosity-temperature characteristics, lower carbon forming tendencies and higher stability in service.

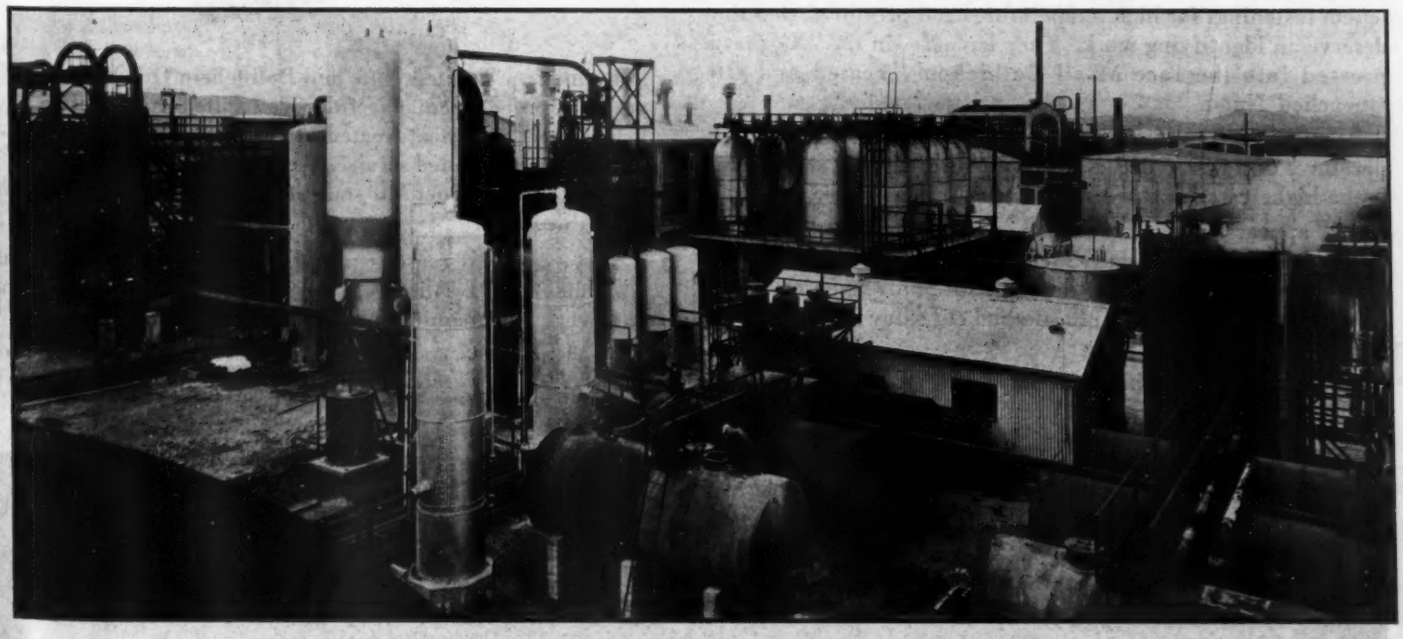
Solvent refining affords the further advantage in that the solvents can be recovered and the high specific gravity extracted materials utilized for the manufacture of a growing group of industrial products. Economies are effected because of the conservation of materials which were formerly wasted or entrained in the acid sludges and a new field has been opened in by-product development including such materials as varnish and lacquer diluents, insecticides and fluxes. The progress of solvent refining is under way and the industry may well look forward to very rapid strides in the manufacture of California solvent refined oils.

With the increasing importance of cracking operations, added impetus is given to the chemical treatment of light oils, particularly gasolines. There has probably been more development work in this field and less published concerning it than with any of the other products. Particular effort is being made to reduce the cost of treatment and at the same time retain the desired quality. Due to high sulfur content in our cracked gasolines the principal objective of chemical treatment is desulfurization. In most cases sufficient treatment is required so as to eliminate gum and color problems. Sulfuric acid treatment continues to be the principal agent for this purpose. Economies in this respect have been effected by the segregation and selection of cracking stocks which yield low sulfur pressure distillate, or distillate which can be easily desulfurized. Under normal conditions pressure distillates require very heavy acid treatment and all efforts are directed toward the preservation of desired properties. Recently, considerable activity has been noted in the tendency to separate endpoint pressure distillate into two or more well fractionated portions for separate chemical treatment. Some refiners thus effect a saving by the lighter treatment on more volatile fractions.

Treatment of California distillates by company owned processes employing sulfuric acid at low temperatures has proven successful and efficient. The acid at low temperatures does not attack unsaturates as readily, therefore enjoying greater freedom as a selective solvent for the sulfur compounds. It is desirable that the stable unsaturates be retained to maintain antiknock value and that polymerization be prevented as far as possible.

Treating with "doctor" solution to accomplish the final sweetening is still in general practice. There have recently been small scale operations with magnesium hydroxide to accomplish the same result.

The many vapor phase processes being used elsewhere have not found general application in California, being less adapted to our local refining requirements. Two of California's refineries, however, are using vapor phase treatment employing aqueous zinc chloride for the treating agent.



Doctor treating plant including distillate rerunning equipment in the Associated Oil Company's Avon refinery

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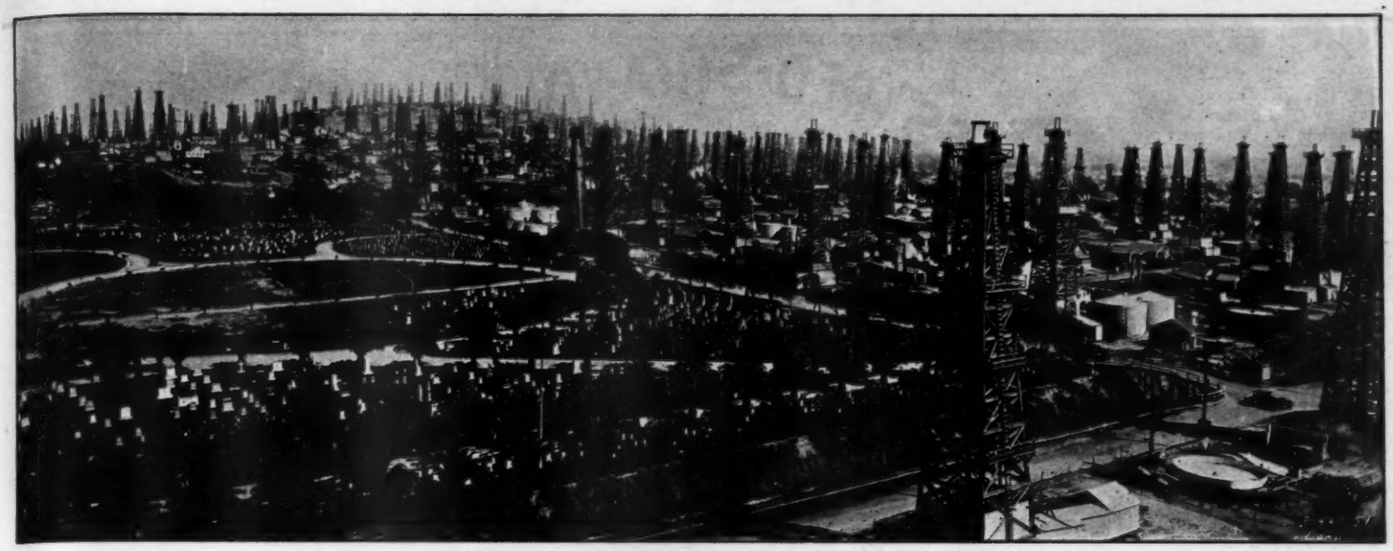


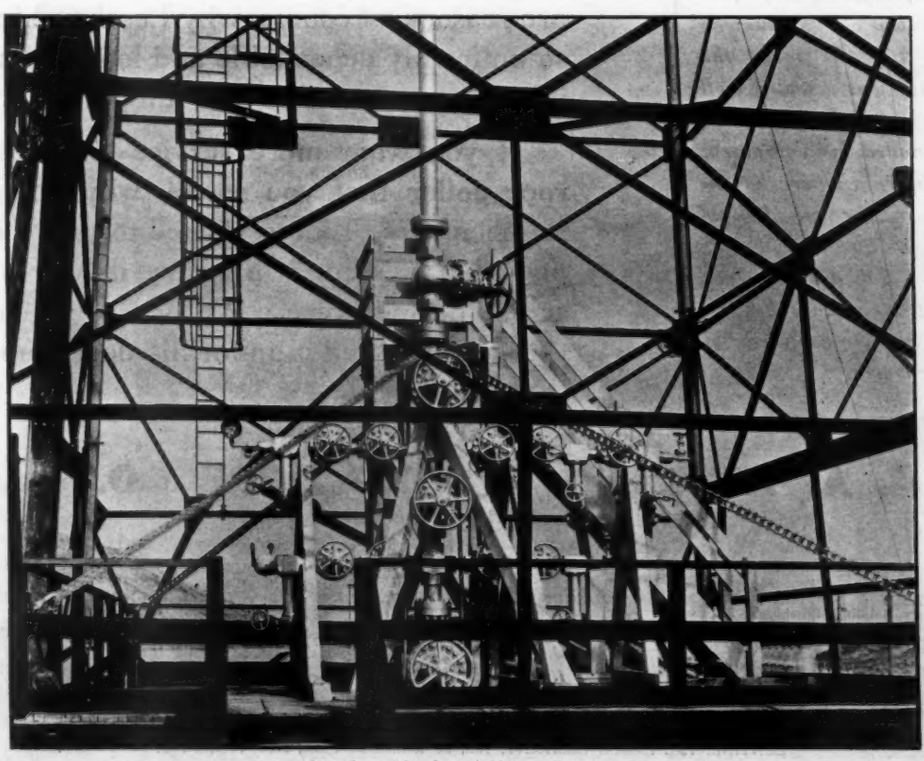
Oil field and graveyard, Long Beach Field, California

California Needs 200,000,000 Barrels of New Crude Reserves Each Year

By L. P. STOCKMAN

If California is to retain its position as a major oil-producing state and maintain its present status in the export markets of the world, operators must discover approximately 200,000,000 bbls. of new production annually. Reserves are in sight to meet requirements for the next several years, but steadily increasing consumption and the necessity of preserving a maximum margin of safety demand increased crude oil reserves. It is possible closely to approximate proved reserves, but prospective reserves are of such an intangible nature that little weight can be assigned to them. However, there are certain phases of prospective reserves that justify consideration due to the existence of definite factors upon which to predicate expectations.

Progressive deep drilling in several fields during the past 10 or 15 years has substantially enhanced the possibility of developing deeper production in rocks of an older age, and further work along this line may result in removing what appears to be the maximum limit of production from a geological standpoint, just as deep drilling subsequent to discovery of fields along the Newport-Beverly sheer zone of Los Angeles Basin greatly enhanced production possibilities by the development of substantial production in rocks of Miocene age. Previously the Miocene had been considered as potentially productive in Los Angeles Basin and it is interesting to note that formations of Oligocene age occupy a position somewhat similar to that occupied by the Miocene before it was definitely proved productive. In the North Belridge Field of Kern County, within the past few years, operators have extended the geological column of production by developing substantial production in rocks of Oligocene or possibly Eocene age, and over on the coast in Santa Barbara County, operators have developed large production in the Vaqueros and Sespe formations in that area. The significance which attaches to this lies in the fact that it tends to indicate that certain formations of Oligocene and Eocene age ultimately may be found productive with deeper drilling in other fields in the San Joaquin Basin and that the lower Miocene, Oligocene and Eocene also may be found productive in several Los Angeles Basin fields. This possibility points to a prospective reserve, although its importance cannot be fully appreciated until actual development takes place. With the possible exception of West Coyote, Inglewood and Dominguez, Los Angeles Basin fields are generally considered as having attained maximum development, but here again, however, there exists a possible prospective reserve because in several fields there are potentially productive formations which may become of importance from a production standpoint with deeper drilling.



Standard Oil Company of California's No. 8-1P in Kettleman Hills Field

The time element and the rate of production are important factors in the future reserves of the state. When California reaches the point where difficulty is experienced in meeting the demand, producing operations will become more efficient and it is therefore logical to assume that improved production methods may increase future production, in which event the reserves set up at present would ultimately be found inadequate.

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Improved production methods, the attainment of greater efficiency in refining operations, more efficient drilling technique which will permit the drilling of deep wells with a minimum hazard, and more efficient utilization of refined oils will result in a larger ultimate production of crude oil, increased production of refined products and a more efficient utilization of the heat value and energy of refined oil. Repressuring of depleted oil zones by the injection of natural gas may also become of greater importance and thus increase the total ultimate recovery of crude oil.

Most of California's production at present is coming from three well-defined basins and along well-defined areas of horizonal sheering. These three productive areas are generally known as Ventura Basin, San Joaquin Basin and Los Angles Basin. In addition to these three primary basins, commercial crude oil production is also found in California along the coastal region of Santa Barbara and San Luis Obispo Counties and include productive oil fields at Elwood, Summerland, Santa Barbara Mesa, Capitan and Arroyo Grande, and a gas field at Goleta. The Santa Maria Basin, which is relatively limited in area, contains a number of separate fields, the most important of which at present are Santa Maria, Lompoc and Casmalia.

Geologically, the southern San Joaquin Basin is similar to Los Angeles Basin, although it is several times larger. Both basins have at their centers organic rocks approximately 5,000 feet thick that generate oil, above which there are other rocks several thousand feet in thickness containing relatively soft sands in which the crude oil is trapped. Only the edges of the southern San Joaquin Basin have so far been developed, although the Fruitvale and Mountain View Fields and the Semi-Tropic gas field of Kern County might technically be considered as out on the floor of the valley. These edges in the San Joaquin Basin have yielded fields of importance, including Kettleman Hills, Lost Hills-Belridge, Midway-Sunset, Kern River and Mount Poso, which already have produced a substantial amount of crude oil and natural gas.

The central part of the southern San Joaquin Basin is approximately three times larger than the entire Los Angeles Basin and is practically untested as far as deep drilling and carefully located wells are concerned. San Joaquin Basin fields, based on developments up to the present, do not show the high production per acre characteristic of Los Angeles Basin fields. The San Joaquin Basin is primarily a great block of the earth's crust that has been tilted westward. This tilting brings up granite in the east, but to the west sedimentary rocks appear and they increase in thickness until far out in the center of the basin they appear to be thicker than any drill can penetrate. It is in this large unexplored area to which California operators must look for new fields with which to increase future reserves and offset the normal decline which is constantly taking place in all oil and gas fields.

Considerable exploration work, following a period of inactivity during development of prolific fields of Los Angeles Basin, is scheduled to be undertaken in the San Joaquin Valley during the next several years. Numerous geophysical surveys have already been conducted. It is believed probable that new fields will be located in particular

W. C. Whaley, vice president,
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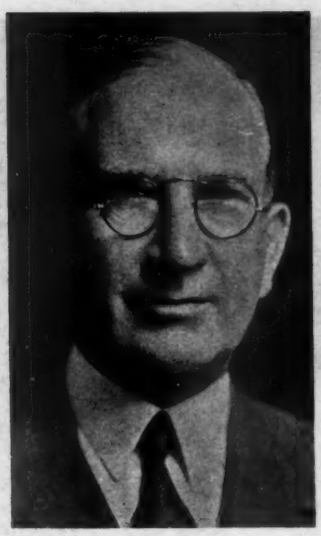

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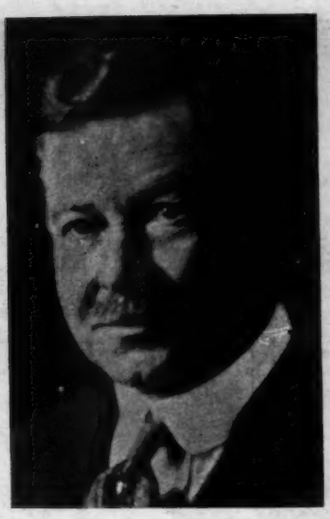

W. W. Orcutt, vice president, Union Oil Co.

W. P. Durkee, Jr., vice president, Shell Oil Co.

areas and almost certainly along narrow lines of horizontal sheering. With few exceptions, only wells located along such lines appear to have a reasonable chance of production. It is possible that there are areas in the center of the San Joaquin Basin that contain lines of horizontal sheering that are not visible due to alluvial fill.

All production on the east side of the San Joaquin Valley was obtained from Pliocene formations in the Kern River Field until the discovery of the Mount Poso Field in July, 1926, at which time production was found in the Temblor formation of Middle Miocene age. This discovery was of economic importance, as it subsequently resulted in the discovery of the Round Mountain Field. The most important structural feature in the east side of the San Joaquin Basin is faulting, as this partially controls the accumulation of oil in the Mount Poso and Round Mountain fields.

Faulting in the Temblor is easily identified by surface exposures as the breaks are well defined and cross faulting is well illustrated in the Round Mountain Field and in the Temblor sediments adjacent to the granite. The Miocene beds in the east side of the San Joaquin Basin occur unconformably below the Kern River series of Pliocene age and it appears that the basal beds of the Miocene were deposited on an uneven granitic basement. The Miocene beds have a maximum thickness of approximately 3,950 feet in the Round Mountain area, but they thicken somewhat to the south.

Los Angeles Basin

Los Angeles Basin, which is relatively small and the most prolific basin for its size in the world, is a deep depression bordered in part on the north and east by faults whose movements have been predominantly vertical. In the central part of the basin, Tertiary deposits approximate 15,000 feet in thickness, although the deepest well drilled in the central part of the valley has been able to get down through only 60 per cent of this sequence. Most of the Tertiary formations thin out rapidly toward edges of the basin, where schists and granitic rocks of the basement complex and other pre-Tertiary rocks either outcrop or are encountered at shallow depths.

The smaller fields of Los Angeles Basin, from a production standpoint, are located around the edges of the basin, while those which have registered prolific production, Long Beach, Santa Fe Springs, Huntington Beach, Dominguez, Seal Beach and Inglewood, rim the deep part of the basin and gather most of their oil from this deep central portion. There are two major lines of anticlinal folding in Los Angeles Basin known as the Newport-Beverly uplift and the Coyote Hills uplift. The former is considered to have resulted from movement along a deep-seated fault extending from Newport Beach northwestward across the basin. These two major lines and adjacent ones of lesser magnitude contain many oil fields in Los Angeles Basin, most of which are on anticlinal folds.

The structure of Los Angeles Basin is to a large extent outlined by topography. Major faulting is generally represented by escarpments and low elevations in line, but such expressions, in many instances, are so eroded and fragmental that they are not obvious. The productive domal structures discovered to date have been represented invariably by surface elevations which range from the elongated hills at Long Beach and Dominguez, closely following subsurface structure, to the low, scat-

William F. Humphrey, president, Tide Water Associated Oil Co.

W. L. McLaine, vice president, General Petroleum Corp.

B. I. Graves, vice president, Associated Oil Co.

Paul M. Gregg, vice president, Union Oil Co. of California

R. A. Sperry, vice president, General Petroleum Corp.

W. H. Berg, vice president, Standard Oil Co. of California

tered swells which faintly indicate the domal structures at Huntington Beach and Richfield.

The oil produced in Los Angeles Basin has come from formations of Pliocene and Miocene age. Beneath these, in the deep parts of the basin, lie the Temblor and Vaqueros formations of Lower Miocene age, the Sespe formation of Oligocene age and certain formations of Eocene age. This geological column is of primary importance because, while Los Angeles Basin is generally considered as having attained maximum development, some fields in this area stand an excellent chance of developing deeper production, as the Temblor, Vaqueros, Sespe and formations of Oligocene age have been found highly productive in other California fields and might be equally as productive in certain Los Angeles Basin fields.

The Temblor formation of Miocene age will probably be the best of the untested formations in Los Angeles Basin fields as it has been found highly productive in the Kettleman Hills and North Belridge fields in the San Joaquin Basin. These possibly productive deeper formations may be expected to exist in the central part of Los Angeles Basin, especially in the Santa Fe Springs, West Coyote, Huntington Beach, Seal Beach, Long Beach, Dominguez, Rosecrans and Inglewood Fields, but will be absent in fields located around the rim of the basin. In the Long Beach and Santa Fe Springs Fields, the Temblor should be found at approximately 10,000 feet. These deeper and possibly productive formations are in large part absent at Playa Del Rey, El Segundo and Torrance, as schist of the basement complex has already been encountered beneath the known oil horizons. It seems probable that much of the oil produced in the fields of Los Angeles Basin comes up through faults from deep generative beds buried in the central portion of the basin. This oil is prevented from rising to the surface by several thousand feet of Upper Pliocene sticky shales.

Ventura Basin

Ventura Basin, although much smaller than San Joaquin Basin, contains the thickest oil formations in California and perhaps in the world. The central Ventura Basin contains approximately 20,000 feet of Fernando (Pleistocene, Pliocene and Miocene) reservoir rocks underlain by approximately 8,000 feet of Modelo and Vaqueros (Miocene) and Sespe (Oligocene) generative and reservoir rocks. The Modelo, Vaqueros and Sespe, in addition to being generative reservoir rocks, are also productive in Ventura Basin. The principal fields in the Ventura Basin are Ventura Avenue, San Miguelito, Rincon, South Mountain and Shiells Canyon. The Ventura Basin has more separate producing fields than any other basin in California. In most cases, however, these individual fields are small and produce only a limited quantity of oil. As is the case in the other basins, many of the fields in Ventura County are located along lines of pronounced sheering. Production is developed in these fields in anticlinal and monoclinal structures and also in faulted sections where the oil has been trapped.

The topographic features of Ventura County consist of a high rugged mountainous area in the northern section of the county, a series of valleys draining the south central portion and another mountainous area located along the coast in the southeast quarter. There are three river valleys in the south central portion and these contain

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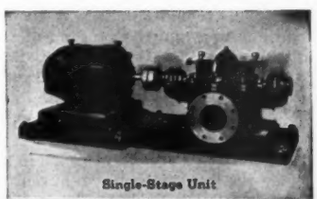

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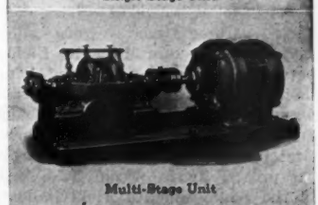

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several proven oil fields, one of which, Ventura Avenue, located a few miles north of the city of Ventura, is one of the most prolific discovered in California. This field has enormous drainage area and great thickness of oil-bearing formation.

The large drainage area of this structure is an important factor with respect to the quantity of oil found in the Ventura Avenue Field in as much as the anticline has only one major dome, from Padre Juan Canyon on the west, to Aliso Canyon on the east, and the large quantity of oil is therefore in one reservoir. The drainage area extends about 1 mile north of the axis and at least 3 miles south of the axis for about 14 miles. The area on the north is cut off by a syncline and a fault. Operators in the Ventura Avenue Field have not yet succeeded in drilling entirely through the Pliocene, although commercial production has been developed below 9,700 feet. The three valleys referred to are generally known as Ojai Valley, Santa Clara Valley and Simi Valley, the latter two joining west of South Mountain. The geological formations in the Ojai Valley consist principally of a broad mass of Monterey shale which is exposed along Sulphur Mountain and in the hills in the northern part of the valley. There is a narrow strip of Sespe in the intervening area in which has collected migratory oil formed in the Diatomacious shales of the Monterey.

Ventura Avenue

The prolific Ventura Avenue Field is located in close proximity to the center of the deepest Tertiary Basin in the world, as formations of this age reach a thickness of about 35,000 feet. No other productive basin in California has more than half of this astonishing thickness, which is important because it will necessitate the drilling of extremely deep wells to penetrate even a small portion of the potentially productive formation. Wells in the Ventura Avenue Field start approximately 6,000 feet below the top of the Pliocene and the deepest wells finished up to the present time, about 9,500 feet, when put on production are still in the Pliocene. In all other major fields of southern California the Pliocene and Upper Miocene have both been found to be highly productive and as there are no exceptions of record to this rule, it is presumed that this relation also exists in the Ventura Avenue Field.

Operators in that field are almost definitely assured of more or less continuous production down to approximately 13,000 feet and have in addition about 7,000 feet of formations of Lower Miocene, Oligocene and Eocene age that have been found productive in other California fields. Although deep drilling records have been broken with great frequency during the past few years, the possibility of developing production down to 20,000 or 25,000 feet appears impossible, but at the same time it may become a reality in the Ventura Avenue Field. It appears probable, therefore, that some operator in the Ventura Avenue Field eventually will establish a deep drilling record, for if oil is present at the depths estimated, these operators will go after it.

The Ventura Avenue Field is located on the structurally highest part and in about the center of the large and perfectly closed Ventura anticline, a sharp and well-defined fold, approximately 16 miles long and extending generally east and west. The structure is characterized by steep dips which range from 30 to 60 degrees on the flanks of the anticline. Although the Ventura Avenue anticline is practically symmetrical, in the center of the field it is not entirely so. For example, about 1½ miles east of the center of the field in Hall Canyon, the axial plane has a pronounced dip to the south amounting to 600 feet or more in 5,000 feet of depth. Beyond this point, to the east, the structure appears to become gradually symmetrical again. West of the center of the field the axial plane dips to the north. Although the Ventura anticline is in an area of relatively recent physiographic development, the topography does not reveal much indication of the presence of a fold of such magnitude. There is no evidence of an anticlinal ridge nor is there any pronounced line of uplift along the axis of the structure.

The anticline is dissected at the surface by 11 stream courses varying in magnitude and direction, the most conspicuous being the canyon of the Ventura River. Near the dome of the Ventura Avenue anticline, along Ventura River, the major streams cut across it at right angles without special regard to the geologic structure. However, streams that cut the anticline farther down the plunge, on either side of the dome, are influenced by the folding, and swing in a curve around the nose of the structure. The highest elevation in the productive area is about 1,200 feet above sea level, while the lowest elevation is about 100 feet, where the Ventura River cuts through the anticline at right angles. There are approximately 300 acres of flat land in the field in the Ventura River Valley, where the anticline is structurally higher. The remaining acreage of proved land is in the hills. This condition has necessitated extensive road building and the grading of rig sites on steep hillsides. One location required the excavation of a 90-foot cut and the moving of approximately 35,000 cubic yards of material.

San Miguelito

In addition to the prolific Ventura Avenue Field, the major Ventura anticline contains two lesser productive areas. These are the Rincon Field, at the extreme western end of the anticlinal uplift, and the San Miguelito Field, about midway between Ventura Avenue and Rincon. San Miguelito was pioneered by the Chanslor-Canfield Midway Oil Co., although the Continental Oil Co. finished the first commercial producer and was the first operator to get acreage within what is now the proven limits of the field. Surface exposures in the San Miguelito Field indicate the presence of a small closed anticlinal structure which has no connection with the Ventura Avenue Field except that both are located along the same major uplift. The San Miguelito Field is structurally different from Ventura Avenue because the subsurface structure of the former's productive formation has been complicated by extensive faulting and resulting fracturing in subsurface strata. The locating of wells, erecting of rigs and construction of supplementary facilities have been an interesting problem incidental to development of the San Miguelito Field.

The topography of this field is unusually rough and the hills have precipitous sides. The Continental's discovery well is located at an elevation of 783 feet above sea level, with the shore line of the Pacific Ocean less than 7,000 feet distant. The area is so rugged that it was necessary to build 11,000 feet of mountainside road to reach the site

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of No. 1 Grubb, the discovery well. A deep cut was made into the hillside to provide room for the derrick, boilers and other equipment. Approximately 40,000 cubic yards of material was moved in the building of the road and leveling of the drilling site preparatory to erecting the rig. One other operator, while grading location for an outpost, suffered a landslide and it required a second steam shovel to uncover the first, which had been buried.

The San Miguelito Field is being developed in accordance with generally accepted principles of oil field practice, which include normal spacing of wells and adequate protection of the producing horizon. Deep-zone possibilities of the San Miguelito Field can be determined only by actual drilling as the fractured condition and the effect of faults on the accumulation preclude anything more than a guess. From a geological standpoint, the San Miguelito Field should contain additional productive horizons, but structural conditions may be the dominating factor with respect to deeper zones.

Rincon

The Rincon Field, in the extreme western end of the Ventura anticline, is situated on the edge of the Pacific Ocean 10 miles northwest of the city of Ventura, and has the distinction of being one of the few fields located at a point where land and water meet. The topography of the region is characterized by high, steep, brush-covered hills slashed by narrow gullies. A small portion of the field is on property which has an elevation of approximately 20 feet, but to the east the topography is rough and rugged and reaches an elevation of approximately 2,000 feet above sea level. The western end of the Rincon Field is beneath State tideland and has been developed by the construction of drilling wharves, along which are located wells at normal distances. The Rincon Field was discovered by the Chanslor-Canfield Midway Oil Co. and, unlike Ventura Avenue and San Miguelito, did not show high flush production. Relatively large flowing wells were completed in the Rincon Field, but the proximity of these wells to an overdeveloped area prevented them from showing long-sustained production.

Production was obtained in the Rincon Field of Ventura County in the Pico formation of Pliocene age, but subsequent development may have been in the Upper Miocene. The Pliocene, which overlies this entire area, is composed of coarse to fine, reddish-yellow to buff, loosely consolidated to semi-indurated sandstones and conglomerates containing distinctive, hard limonitic concretions, interbedded with smaller quantities of tough, sticky and sandy bluish-brown and silty yellowish shales. The sandstone and conglomerate beds are scantily impregnated with tar, and while they have the appearance of soil, they give a good cut in the presence of ether. The top oil zone, approximately 230 feet thick, consists of oil sand, brown shale and occasionally a thin streak of gray sand. The second productive horizon, the Miley zone, is approximately 1,900 feet thick and consists of brown shale and oil sand varying from fine medium-grained to coarse-grained, compact oil sand with a rich to poor saturation, depending on the location in the field. The field was developed with rotary drilling equipment and may have deep-zone possibilities.

Revision Necessary

Developments during the past few months tend to indicate that California's crude oil reserves may not be as large as estimates made a few years ago seemed to show. This is particularly true because of the important position occupied by the Kettleman North Dome Field, which, due to its relatively large ultimate production, will be a dominating factor in future production. There has been a noticeable tendency on the part of engineers to reduce their estimates of probable ultimate production in the Kettleman North Dome Field and even those who were ultraconservative have deemed it wise to reduce original prognostications. Notwithstanding the necessity for a revision, there is a possibility that reserves have been underestimated. The North Dome of Kettleman Hills has been a source of much speculation since its discovery by the Milham Exploration Co. a few years ago and preliminary estimates, which ranged as high as 4,000,000,000 bbls., have been proven fallacious. When the Pacific Gas & Electric Co. was

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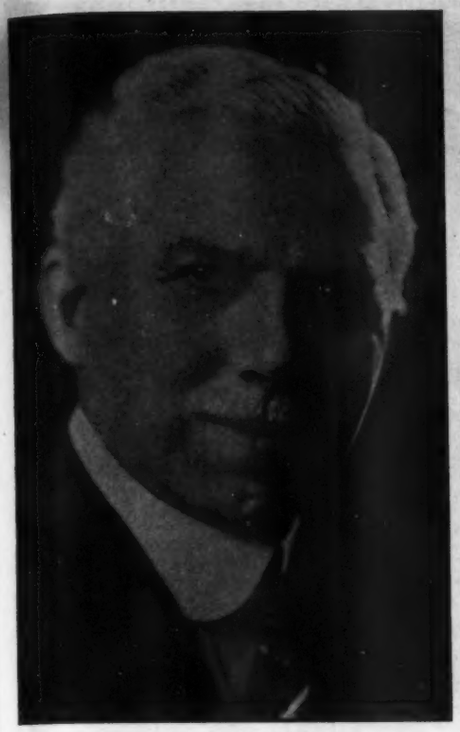

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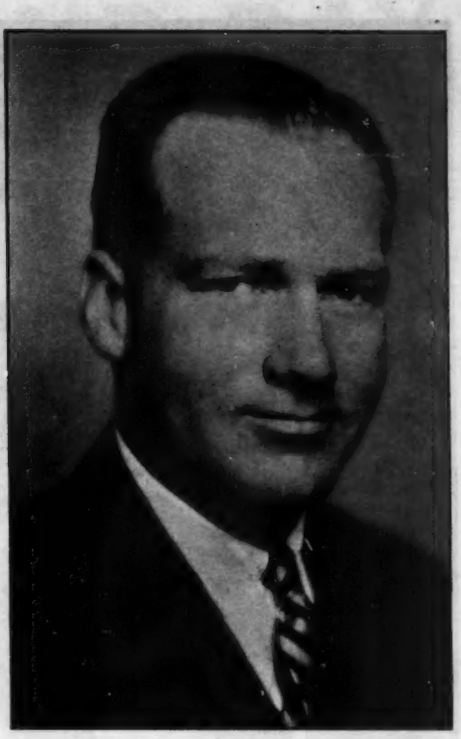
W. C. McDuffie, receiver, Richfield Oil Co.



W. L. Stewart, Jr., vice president, Union Oil Co.

contemplating the installation of its first natural gas transmission line engineers estimated that the Kettleman North Dome Field contained enough natural gas to supply the San Francisco Bay region for 70 years at the prevailing rate of consumption. This estimate has been found erroneous and, instead of having an almost inexhaustible supply of natural gas, operators in the North Dome are seriously concerned about the rate at which the gas of this field is being produced.

The large volume of natural gas being moved out of the Kettleman North Dome Field is one reason why engineers have found it necessary to revise their estimates of the ultimate production of this field. Operators interested in the field have come to the realization that it is almost imperative to conserve as much gas as possible in order to maintain uniform pressure throughout the field. This factor is important because the productive sands in the North Dome are compact and their future productivity depends upon the ability of operators to maintain a gas pressure sufficiently high to drive the oil through this tight sand.

The sands in the Huffman area, which is the most productive section of the field, are loose enough to permit normal production, but in the eastern end the sands become tight and show a corresponding decrease in porosity. Some parts of the Huffman area have already yielded 70,000 bbls. to the acre and will undoubtedly exceed 150,000 bbls. to the acre, but it is unlikely that the field as a whole will average 75,000 bbls. per acre. Pressures in the Huffman section have shown a substantial decline and at the present rate of production a number of additional wells will soon have to be placed on gas lift in order to produce. During the period of unrestricted production this year, gas production in the North Dome exceeded 300,000,000 feet per day.

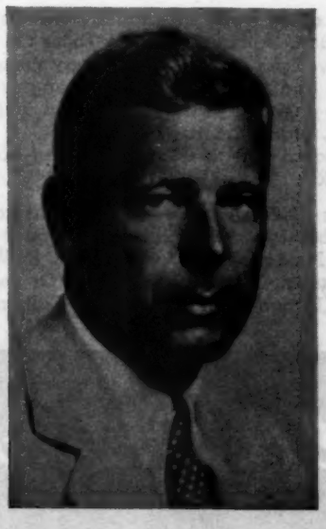
Kettleman Hills

The Kettleman Hills occupy a strip of land approximately 5 miles in width and extending for a distance of 30 miles along the west side of the San Joaquin Basin between Coalinga and Lost Hills. The hills, which contain two productive areas, Kettleman North Dome and Kettleman Middle Dome fields, and one area, the South Dome, which has not yet been found productive, rise from the Kettleman plains on the west to a height of about 700 feet and descend to a slightly lower elevation on the east. Kettleman Hills are a continuation to the south of the Coalinga anticline and production up to the present time is coming from the Temblor formation of Miocene age. Several productive zones exist down to the Whepley shale which lies at the base of the fifth oil and gas zone, and production has also been found below this shale body. The Huffman section is the most productive area in the Kettleman North Dome Field, although, due to limited development, the potentiality of the eastern part of the Kettleman North Dome has not yet been definitely determined.

Early development of the Kettleman North Dome Field permitted operators to take in approximately 1,000 feet of productive formation, but it is customary to produce from about 500 feet of oil sand. In certain areas where approximately

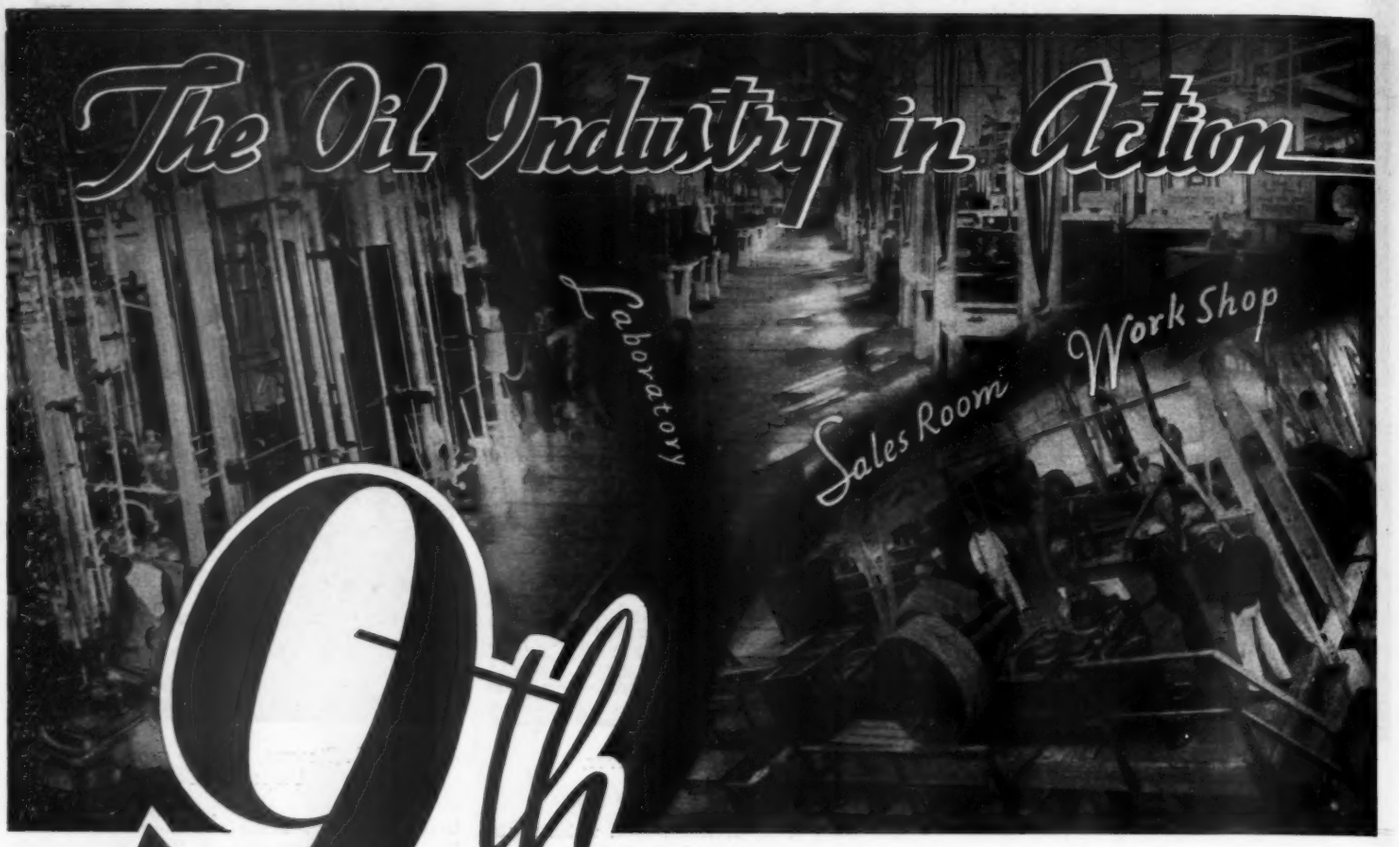
T. L. Taggart, president, California Natural Gasoline Assn.

H. N. Marsh, production engineer, General Petroleum Corp.



O. C. Field, president, O. C. Field Gasoline Corp.

Ed McAdams, president, North Kettleman Oil & Gas Co.



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TULSA May 16-23, 1936

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1,500 feet of sand is open, operators have found it advisable to use casing containing perforations and blank pipe in order to exclude thief sands of low pressure or possible water sand. Development in the Middle Dome of Kettleman Hills has not progressed far enough to reveal the total thickness of productive formation, as operators have restricted penetration to a few hundred feet in the productive horizon. Deep zone possibilities in the Kettleman North Dome and Kettleman Middle Dome fields are excellent and something definite along this line may be determined soon due to deep drilling being done by the Union Oil Co. on the Lillis-Welsh property. Both the north and middle domes are anticlinal structures with perfect closure.

North Belridge

The North Belridge Field of Kern County is one of California's primary reserves as operators have severely curtailed production since development of prolific production in deeper zones discovered by the Belridge Oil Co. Due to deep zone discoveries in this field, an entirely new value has been attached to oil lands along the western rim of the San Joaquin Basin, as the development of substantial production at North Belridge and in the North and Middle Domes of Kettleman Hills indicates that deep zones in other fields in this area may likewise be found productive with deeper drilling. Attempts to develop deep production in the South Belridge and Lost Hills fields have been unsuccessful, but it will require the drilling of several additional wells before these fields can be considered devoid of deeper zones.

Only one deep well has been drilled in the South Belridge Field and this project, situated in Section 30-28-21, was not located any too favorably with respect to structure. This deep test was the General Petroleum's No. 1 Berry, which looked good enough to justify a production test at 11,377 feet. Mechanical trouble developed at the last minute and drilling operations were suspended. The several deep tests drilled in the Lost Hills Field have all been located north of the field due to the fact that the north end of the Lost Hills structure and the south end of the Kettleman South Dome structure are open and thus tended to indicate that there might be some connection between the two structures. Decision must be reserved regarding deep-zone possibilities at South Belridge, Lost Hills and Kettleman South Dome.

The North Belridge Field, located on the west side of the San Joaquin Basin in the northwestern part of Kern County, is approximately 5 miles southwest of the Lost Hills Field, about 4 miles due north of the South Belridge Field and 50 miles northwest of Bakersfield. The structure of the North Belridge Field is domal with the axis of the anticline trending in a northwest and southeast direction. Formations penetrated in this field are Tulare (Pleistocene-Pliocene), lower Etchegoin (lower Pliocene), Santa Margarita (upper Miocene), brown shale (upper Miocene), Temblor (middle Miocene) and San Emigdio (Wagonwheel zone) which may either be of Oligocene or Eocene age. Two deep productive zones have been discovered in the North Belridge Field, both exceptionally prolific. The limits of the Temblor and Wagonwheel zones have been determined in every direction and consequently future work will consist of development of proved acreage and, later the drilling of deep tests below present production.

Approximately 1,000 acres have been found productive in the North Belridge Field. The first Temblor sand in the North Belridge Field is approximately 160 feet thick and is underlain by a 25-foot stratum of hard sandy brown shale. Below this shale body is an oil zone approximately 85 feet thick, designated as the second Temblor zone. Below this zone there is a second sandy shale body approximately 25 feet in thickness and below this lies the third Temblor zone. Several wells in the North Belridge Field are producing from approximately 500 feet of formation, which includes the three zones just enumerated. The Wagonwheel zone, deepest productive horizon in the North Belridge Field, which may be Oligocene or Eocene age, has a thickness of approximately 500 feet on top of the structure.

Rotary drilling has been used exclusively in the North Belridge Field, and high pressures encountered make it obligatory to use the safety devices designed to control heavy gas pressures. Mud

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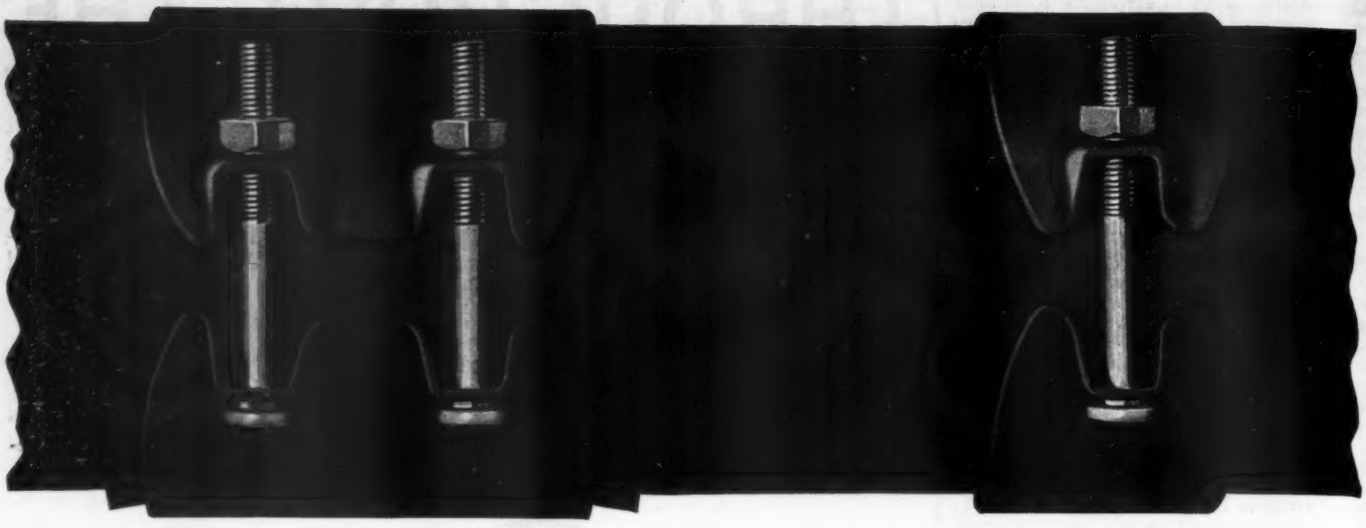

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fluid of approximately 80 pounds is of sufficient weight to control the gas pressure in the Monterey shale and when drilling through the Temblor. In drilling these deep wells extreme care is exercised to keep the hole straight and as far as can be determined no well which has been completed in the lower zones has shown more than a nominal deviation from the vertical.

The Lost Hills Field of Kern County is located north of the North Belridge Field and a little north and west of the Semi-Tropic Gas Field. The presence of the Lost Hills anticline is suggested by the topography of the hills which consist of a ridge that attains a maximum height of 150 feet and which extends from northwest to southeast for about 8 miles. The name of this field is attributed to the fact that Lost Hills, though easily seen from the east, appear to be lost to one on the west, where the slight eastward rise is apparent to the eye. Outcrops are rather scarce and in several places the character and position of the beds that crop out are difficult of recognition. Wells in the field indicate a well-defined anticlinal structure with dips approximating 15 degrees on the flanks of the fold in beds of the McKittrick formation. The productive limits of the Lost Hills Field are completely outlined as far as present production is concerned, although exploration work between Lost Hills and the Kettleman South Dome may change the aspect later.

Most of the oil produced in the Lost Hills Field comes from the basal beds of the McKittrick formation directly overlying the Maricopa shale, which may have been the original source of the oil. The quality of oil produced in the field differs according to the distance above the shale, the lightest oil coming from beds close to the shale near the axis of the anticline and the heaviest from upper beds and those further removed from the axis. Two distinct oil zones, separated by a shale body, exist in the Lost Hills Field. Deep zone possibilities remain to be determined by wells drilled in the center of the field because up to the present time, deep drilling has been limited to the area in the extreme western end of the structure, which appears to be open as far as closure is concerned.

Mount Poso

The Mount Poso Field of Kern County is located on the eastern rim of the San Joaquin Basin, approximately 15 miles northeast of Bakersfield. Mount Poso is the most northerly of fields on the east side of the San Joaquin Basin and the productive zone lies within the Temblor of Miocene age. The topography of the area consists of a series of rolling hills averaging approximately 1,100 feet in elevation with the drainage area to the south and east, although the topography has little relationship to the underground structure. The structure controlling the accumulation of oil in the Mount Poso Field is a southwesterly dipping monocline in which the productive zones are truncated and sealed on the northeast by a normal fault. The conditions are such that impervious shale beds were brought into position opposite the porous sands of the productive zone and it is in these porous sands that accumulation has occurred.

The surface formations in the field consist of the Kern River series of Pliocene age and the beds, which are characterized by an absence of fossil markers, are composed of coarse unsorted sands and clays. The Kern River series has a thickness of approximately 400 feet. The Temblor formation unconformably underlies the Kern River series and sands of the first Vedder zone lie just below a hard zone consisting largely of sea shells at an average depth of approximately 1,200 feet below the top of the Temblor. The producing zone is made up of coarse, angular to medium grained, well rounded sands separated by numerous hard calcareous shells containing sea shells. The first Vedder zone has a maximum thickness of approximately 85 feet, while the second Vedder zone is approximately 100 feet in thickness and shows a somewhat larger production. This field has been developed in accordance with recognized standards of drilling and production procedure. Deep zone possibilities are negative, although additional drilling may result in the extension of the present limits of production.

Mountain View

The Mountain View Field of Kern County, pioneered by the Shell Oil Co. but proved commercially productive by Dana Hogan, is located on the Bear Mountain sheer zone about 15 miles southeast of Bakersfield. Although deeper drilling may ultimately become of more importance from a production standpoint, the Mountain View Field can hardly be designated as of primary importance at present. The accumulation of oil in the Mountain View Field is due to faulting, which has trapped the oil behind the major fault, which runs southeasterly from the Fruitvale Field and Union Avenue district to the southeastern end of the Mountain View Field and which definitely establishes the northern limits of production at Mountain View. The area showing the largest concentration at present is in the vicinity of the Hancock Oil Co.'s Miller lease in Section 14-30-28 and, as in other similar conditions, maximum production is obtained in close proximity to the dominating fault.

Two productive horizons have been found as a result of drilling operations in the Mountain View Field. The first productive horizon is in the Chanac formation of Pliocene age and the second productive zone begins below the base of the Chanac in the Santa Margarita formation of Miocene age. The productive Chanac zone is encountered between 5,000 and 5,500 feet and the Santa Margarita productive zone is encountered at depths varying between 5,700 feet and 6,100 feet. The Chanac zone permits an average penetration of approximately 100 feet, while the Santa Margarita is somewhat thicker. Due to structural conditions, a much larger penetration can be taken in areas located in close proximity to the fault in contrast with conditions out on the edges, where the accumulation pinches out. Deep-zone possibilities of the Mountain View Field are favorable from a geological standpoint, but, since structural conditions dominate the accumulation, this can only be determined by actual drilling.

Round Mountain

The Round Mountain Field of Kern County is located along the eastern rim of San Joaquin Basin and about 11 miles northeast of Bakersfield. The field, which consists of two separate producing areas, designated as Round Mountain and Coffee Canyon, lies near the axis of the Kern River nose, which is a broad anticlinal structure that plunges to the southwest. The Round Mountain area was discovered by the Elbe Oil Land Development Co. in May, 1927, and the Coffee Canyon area by the Lindsay Oil Co. in August, 1928. Both Round Mountain and Coffee Canyon have the same form of structural trap, the oil having accumulated against a fault seal in a gently dipping monocline. Producing zones in the Round Mountain Field are found in the lower Temblor, which consists of 1,500 feet of silt and sand. The upper 550 feet of this 1,500 foot segment comprises fine sandy siltstones and fine silty sand containing ashy materials. Below this 550 feet, designated as the Jewett Micaceous silt member, there is a Micaceous silt member consisting of 650 feet of brown Micaceous siltstone containing sandy lenses and a pebble bed. The lower 300 feet of the 1,500 foot segment is known as the Vedder sand member and consists of fine to medium-grained sand with streaks of siltstone, some pebble beds and coarse sand lenses.

The productive oil zones in the Round Mountain Field are found in the Jewett Micaceous silt mem-

Neal H. Anderson, president,
Oil Producers Agency of California

P. H. Patchin, director,
Standard Oil Co. of California

William Reinhardt, general manager,
Kettleman North Dome Association

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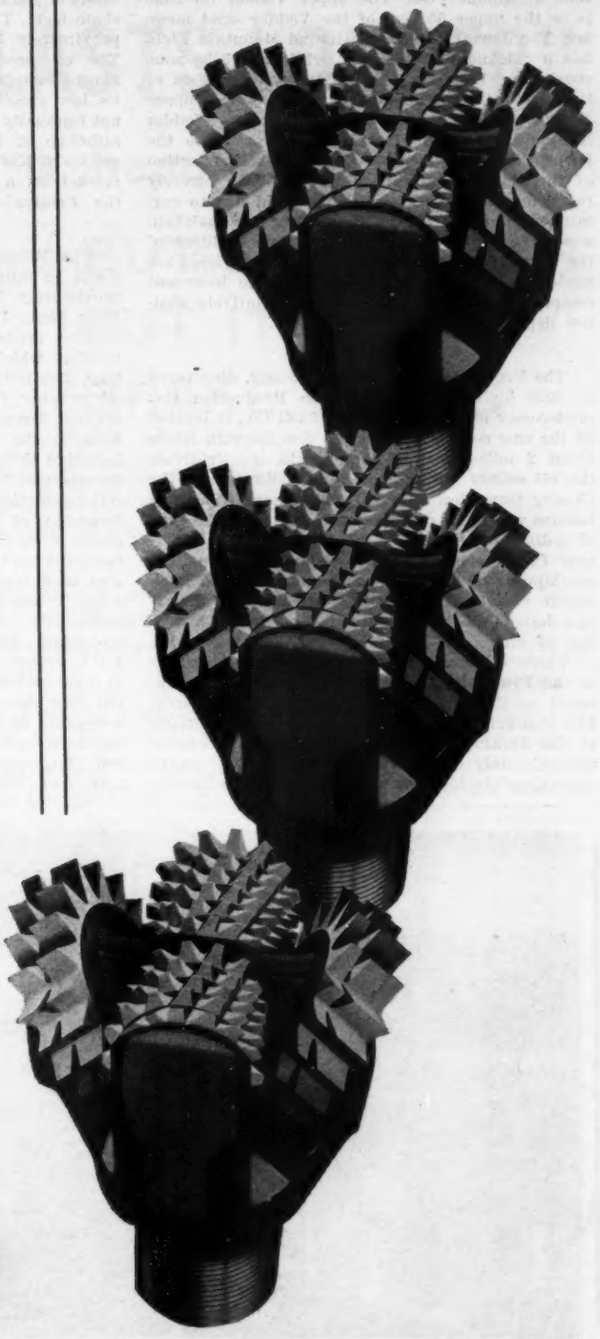

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ber and in the Vedder sand member of lower Temblor. The oil zones are known as the Jewett, Elbe and Vedder zones. The Jewett zone is in the upper 350 feet of the Micaceous silt member, while the Elbe oil zone is in the basal 150 feet of this same silt member and is the equivalent of the Rench zone at Mount Poso. The upper Vedder oil zone is in the upper 55 feet of the Vedder sand member. The Jewett zone in the Round Mountain Field has a thickness of 450 feet, while the Elbe zone consists of 150 feet. The Vedder zone consists of two separate horizons, designated as the upper Vedder and the lower Vedder. The upper Vedder is approximately 40 feet in thickness, while the lower Vedder is about 100 feet thick. Production of the Round Mountain Field has been severely restricted since discovery of the field due to curtailment and the desire of operators to maintain a reserve in this area. Deep-zone possibilities of the Round Mountain and Coffee Canyon fields are conjectural due to the presence of the basement complex which is encountered at a relatively shallow depth.

Fruitvale

The Fruitvale Field of Kern County, discovered in 1928 by the Pacific Eastern Production Co., predecessor of the Western Gulf Oil Co., is located on the east central edge of the San Joaquin Basin about 2 miles west of Bakersfield. At Fruitvale the oil occurs within lenticular sediments of the Chanac formation and the predominant structural feature within this monocline is faulting. The type of sedimentation within the Chanac is an important factor controlling the accumulation, as the overlapping of lenses of shale and sand and horizontal variation in lithology within this formation have probably prevented the further migration of oil.

Three oil zones have been proven productive in the Fruitvale Field and they have been designated as the Contact, Martin and Kernco zones. The Contact zone includes the productive horizon at the Jacalitos-Chanac contact, which occurs at approximately 3,450 feet. The Martin zone occurs approximately 150 feet below the Jacalitos-Chanac contact and this zone attains a thickness approximately 120 feet. Production first was obtained in the Fruitvale Field while testing what subsequently was classified as the Kernco zone. This horizon is located approximately 275 feet below the Jacalitos-Chanac contact and is separated from the water sands of the basal Martin zone by a relatively thin shale body. The Kernco zone, which occurs at approximately 3,750 feet, is about 220 feet thick. The oil produced in the Fruitvale Field tests approximately 22.5 degrees A.P.I., and because of its low gasoline and high residuum content it is not especially desirable from a refining standpoint, although it is being blended with the heavier grades of Kern River crude and has found a ready market as a fuel oil. Deep-zone possibilities of the Fruitvale Field appear rather remote.

Edison

The Edison Field of Kern County is located about 12 miles southeast of Bakersfield and approximately 5 miles northwest of the Mountain View Field. Edison consists of several small productive areas and the structure is a straight overlap, which, as a rule, is not an excellent oil trap. The field produces both a light and a heavy oil ranging from 15 degrees to 29 degrees, the gravity depending upon the depth of completion. Because the productive measures are not conformable throughout the area, it is impossible to discuss the field as a whole. However, commercial production has been developed in the Chanac formation of Pliocene age and in the Santa Margarita formation of Upper Miocene and Temblor formation of Middle Miocene. Small production has also been found at the base of the Kern River series. Production from the Chanac and Kern River series tests around 15 degrees, whereas oil from the Santa Margarita averages about 14 degrees, A.P.I. Production from the Temblor tests between 21 and 29 degrees. The Chanac, which is about 150 feet thick, is picked up at various depths, depending upon which of the several areas is being developed. It should be logged at about 1,300 feet. The Santa Margarita, encountered at about 2,300 feet, has an average thickness of approximately 140 feet. Productive measures in the Temblor are topped at about 2,750 feet and have an average thickness of about 300 feet. The presence of schist and granite immediately below the Temblor precludes deep-zone possibilities.

All measures, with the exception of the Temblor, found productive in the Edison Field are likewise productive in the Mountain View Field, although they are encountered substantially deeper in the latter field and are considerably more productive. The Reserve Oil & Gas Co. appears to have discovered a new field in the Tejon area of Kern County, where it has completed a small well pumping about 25 bbls. of 16 gravity oil per day. This is another overlap phenomenon and it will require the drilling of several additional tests in order to determine definitely the importance of this discovery. The first well, located in Section 2-10-19, was completed at a shallow depth.

Midway-Sunset

The Midway-Sunset Field of Kern County consists of several independent structures and this, together with its age, has enabled the field to produce more oil up to the present time than any other district in the state. Deep-zone possibilities in the Midway-Sunset Field remain to be determined, but drilling operations definitely indicate that it may require extremely deep drilling to get down into rocks of Miocene, Oligocene and Eocene age. The Buena Vista Hills section of the Midway-Sunset Field, in addition to producing a large quantity of crude oil, has probably produced more commercial gas than any other area of equal size in California with the possible exception of Elk Hills. The Kettleman North Dome Field, due to the extensiveness of the structure, tops every field in the state as far as natural gas reserves are concerned and is producing approximately 350,000,000 feet of natural gas per day at the present time.

The development of gas production in the Buena Vista Hills section of the Midway-Sunset Field dates back to 1909, although little of the gas produced prior to 1910 was utilized except as fuel during drilling operations. In 1910, the Cali-

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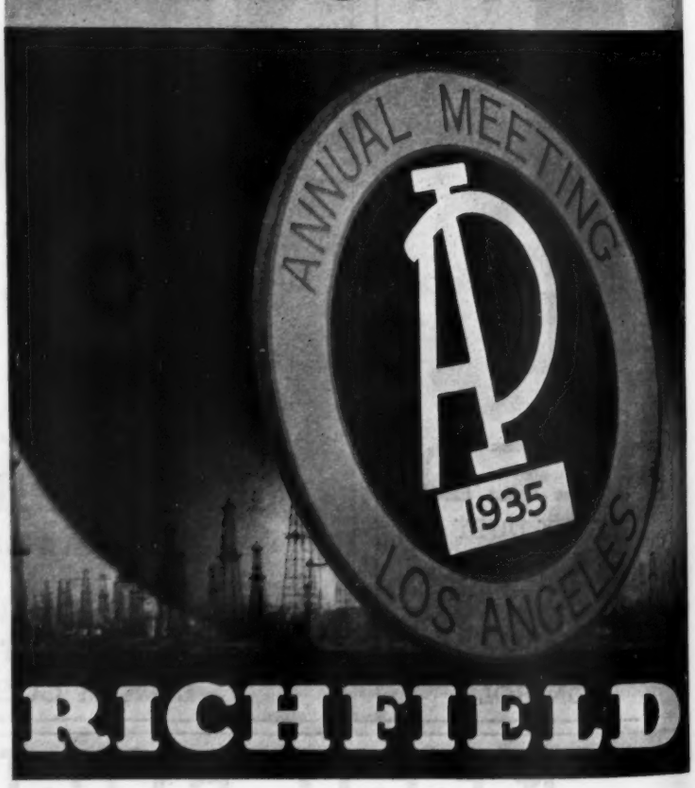

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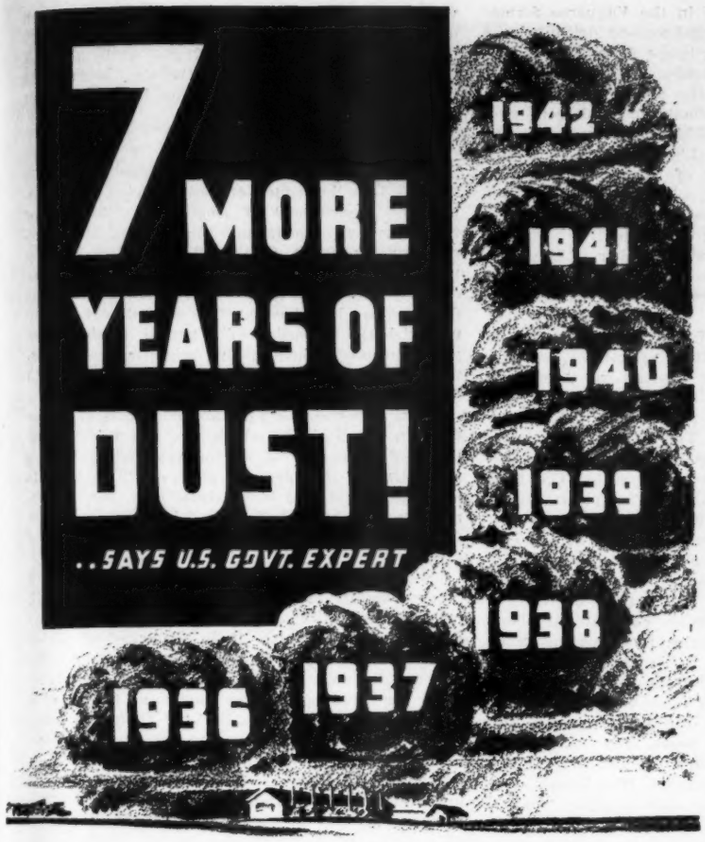

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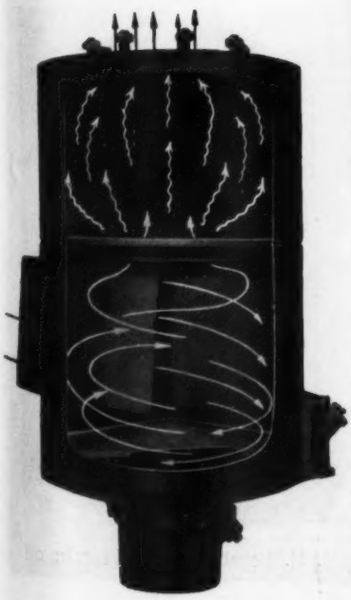

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fornia Natural Gas Co. laid a gas line from Buena Vista Hills to Elk Hills and in 1911 the line was extended to Bakersfield. The Midway Gas Co. in 1913 completed its 12-inch gas line from Buena Vista Hills to Los Angeles, a distance of 107 miles and this installation has remained in continuous operation.

The Midway-Sunset Field produces both a light and a heavy grade of crude oil and, due to the large areal extent of the field, completion depths vary to a large degree. The Thirty-five anticline in the Maricopa section of the Midway-Sunset Field is slightly asymmetric, the dip on the south flank being a little steeper than that on the north. The fold is fairly sharp and the belt near the axis of the fold is fairly narrow, being as a rule not more than 1,500 feet across. The Phoenix syncline, the axis of which lies about 4,000 feet south of the axis of the anticline, separates the Thirty-five anticline from the Temblor Range. The productive zone in the Thirty-five anticline lies in the lower part of the McKittrick group within the Etchegoin formation of Pliocene age. The Paso Robles formation was barren on the Thirty-five anticline.

Elk Hills

There are two separate producing areas in the Elk Hills Field of Kern County with approximately 4 miles intervening between the two districts. Early developments of the Elk Hills Field was greatly delayed by the withdrawals of petroleum lands by the United States Government in 1908-10 and by the extensive litigation which followed. The eastern end of the Elk Hills structure represents a single major anticline with the axis extending almost east and west and with low dips on both flanks. The fold is slightly asymmetrical with the steeper dip on the south side.

Two faults cut diagonally across the axis of the fold in a northeast-southwesterly direction and that these faults have an important bearing upon the drainage and accumulation of oil in the sands is evidenced by the results of drilling operations. The productive oil measures in this field are confined to a well-defined zone about 250 feet thick and occurring in the Etchegoin formation or at its contact with the overlying Paso Robles formation. Overlying the main productive oil sands in the field, there are several fossil markers, the most persistent of which is the Scalez marker, which consists of a thin bed of shells. The Elk Hills Field has deep-zone possibilities, but the importance of this from a productive standpoint can only be determined by actual drilling.

Elwood

The Elwood Field of Santa Barbara County is located at tidewater and, like Summerland and Huntington Beach, a part of the productive acreage is located beneath the waters of the Pacific Ocean. This field was discovered by the drilling of a joint test by the Barnsdall and Rio Grande Oil companies on the Luton-Bell property. First production was developed in the Vaqueros formation of Miocene age, but subsequent drilling later proved up the underlying Sespe formation of Oligocene age to be highly productive. The geological column from surface to the productive Vaqueros oil sand is confined to formations of Miocene age. Wells continue in the middle Monterey shale to a depth of approximately 1,800 feet and then pass through about 1,300 feet of Temblor shale. The productive Vaqueros sand, which is about 300 feet in thickness, occurs immediately below the Temblor formation. Underlying the productive Vaqueros oil sand, which is the lower member of the Miocene series, is the Sespe formation of Oligocene age, which is approximately 3,000 feet thick.

Three zones, totaling approximately 300 feet in thickness, have been found productive in the Sespe as a result of drilling operations, but the fourth Sespe zone, which has not yet been produced, looks like the best of the group. Operators in this field have limited production to the upper two zones in the Sespe. The second Sespe zone has been partially developed, but the third Sespe zone is practically in its virgin state. The first Sespe zone in the Elwood Field is approximately 50 feet thick and is located about 100 feet below the bottom of the Vaqueros formation of Miocene age. The second Sespe zone, which produces gas along with oil, is approximately 75 feet thick and is located 300 feet below the bottom of the Vaqueros. The third Sespe zone, encountered about 700 feet below the Vaqueros, produces gas with the oil and should prove to be the most productive of the three zones logged in the Sespe. A fourth zone is believed to have been logged, but due to mechanical trouble, the discovery well was lost before a test could be made. This zone seemed to have plenty of kick, however, and despite the inability to overcome mechanical trouble and conduct a production test, this horizon offers production possibilities.

Operators in this field have retarded drilling operations and are not making any attempt to develop substantial production in the face of present conditions. Top of the Vaqueros formation is picked up at about 3,100 feet, while the top of the underlying Sespe is logged at approximately 3,500 feet. Deep-zone possibilities of this field may become of importance later.

Santa Barbara Mesa

The Santa Barbara Mesa Field is located immediately adjacent to tidewater about 4 miles west of the city of Santa Barbara. Production of this field is coming from the Vaqueros formation of lower Miocene age, which consists of terrigenous marine sandstones having a thickness of approximately 300 feet. The Vaqueros unconformably overlies the Sespe formation of Oligocene age, which consists of several hundred feet of conglomerates, sandstones and clays. The rocks underlying this region are metamorphosed and igneous rocks of the basement complex. The Sespe formation has a large amount of porous material which, where in contact with a formation from which oil can migrate, may be expected to contain commercial quantities of oil and gas. It is assumed that operators in the Santa Barbara Mesa Field will explore the Sespe formation in that district early in 1936.

Dominguez

The Dominguez Field of Los Angeles Basin is located 14 miles south of Los Angeles and occupies the higher part of Dominguez Hill, one of the prominent topographic features of the Newport-Beverly uplift. The field was discovered by the Union Oil Co. in 1923 after several other operators had failed to do so, and since that time development has proceeded in a systematic manner with the exception of a period of about two years duration when drilling operations were suspended in order to enhance curtailment. This field is being developed in an orderly manner under a uniform well-spacing program and it is the first field in the State in which gas was injected for the double purpose of storing gas and increasing the ultimate recovery of crude oil. The field is an asymmetric anticline, whose only surface expression is a broad hill formed by Quaternary deformation and having the shape of an elongated dome.

Several productive horizons have been found in the Dominguez Field and the Union and Shell, principal operators, are proceeding with Miocene development. Although little evidence of major faulting was noted during development of the upper Callender zones of Pliocene age, this structural condition became an important factor with development of the fourth and fifth Callender zones and subsequent development of formations in the Miocene. This field presents an excellent possibility of showing deeper production in the lower Miocene and possibly the Oligocene. The productive zones in the Dominguez Field consist of a series of horizons, the top of which is encountered at approximately 3,500 feet.

Long Beach

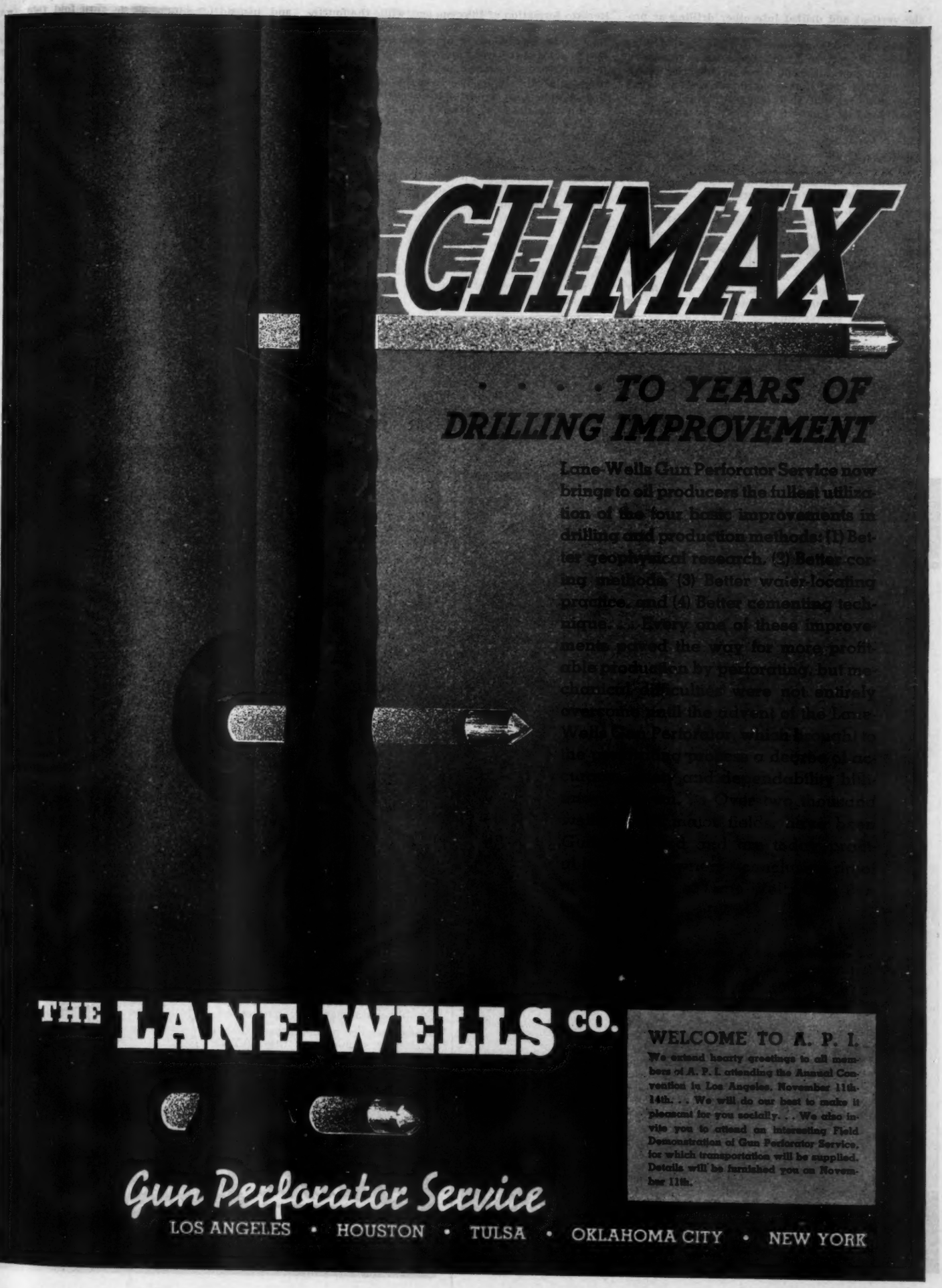
The Long Beach or Signal Hill Field of Los Angeles Basin, which is located approximately four miles southeast of the Dominguez Field in the northern edge of the city of Long Beach, has been one of the two most productive fields of Los Angeles Basin. It was discovered by the Shell Oil Co. in 1921 and reached a peak of 259,000 bbls. in October, 1923. This peak was the result of intensive town-lot drilling, and development of the field has been characterized by a continuance of this activity almost uninterruptedly. This remarkable field, which has produced more oil than any other Los Angeles Basin Field, contains several productive horizons in formations of both Pliocene and Miocene age and is still producing approximately 75,000 bbls. per day, 14 years after completion of the discovery well. Due to competitive conditions and the rapidity with which wells were completed, a number of projects deviated from

A. C. Stewart, manager of specialty sales, Union Oil Co.

Bruce Barkis, general field supt., Rio Grande Oil Co.

L. L. Hillman, president, Hillman-Long, Inc.

J. R. Pemberton, California oil umpire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the vertical and drilled into other drilling or producing wells on adjacent properties.

In later years operators by directional drilling successfully bottomed wells beneath the Sunnyside Cemetery and adjacent acreage, but the courts subsequently held that crooked-hole drilling is not only unethical, but that the willful taking of oil from beneath another's property by directional drilling constitutes grand theft, a felony. A number of wells were abandoned in the Long Beach Field during 1935 as the result of this litigation instituted to prevent any further production from wells which had been intentionally deflected beyond the limits of the property upon which they were located.

The elongated anticlinal character of the Long Beach Field is indicated by a few exposures of gently dipping soft Pleistocene sandstone and a low smooth ridge outlines in a general way the productive area. Prominent topographic scarps along the southwest side and a part of the northeast side of the ridge have resulted from displacements along steeply dipping faults. These faults, however, have exerted only a minor effect upon the accumulation of oil. Production is obtained from about 5,000 feet of rocks which have been divided into four major oil zones, although the oil sand, except for shale breaks, is almost continuous from the 2,200 foot level to the bottom of present production. The three upper zones, Alamitos, Upper Brown and Lower Brown, are in the Repetto formation of Pliocene age, while the fourth is of upper Miocene age. The Pliocene-Miocene contact occurs at a depth of approximately 5,600 feet on the apex of the structure. The Long Beach Field has an excellent chance of showing deeper zone production, although this will necessitate the drilling of wells to a depth of about 10,000 feet. The oil sands in the Long Beach Field are almost continuous from 2,200 feet to the bottom of present production in the Temblor at 8,000 feet.

Seal Beach

The Seal Beach Field is located two miles southeast of the Long Beach Field and about 6 miles southeast of the Dominguez Field. It is another in the chain of oil fields along the Newport-Beverly uplift, and a part of the productive area consists of tideland swamps along the lower course of the San Gabriel River. The surface indications of structure are rather misleading, as the interpretation of structural significance of existing topographic features led to the drilling of 11 dry holes by six operators before the Marland Oil Co., now the Continental Oil Co., completed its discovery well in August, 1926. Subsequent development revealed the existence of two anticlinal folds, one being in the Seal Beach area and the other in the Alamitos Heights section of the field. Development of the field has indicated that, as structural deformation proceeded, a high angle fault was produced along the crest of the uplift and, instead of a large single anticlinal fold, two closely associated anticlines controlled the accumulation of oil. The Seal Beach anticline contains approximately 330 acres and has a closure of about 200 feet, while the productive area of the Alamitos Heights section of the field contains 110 acres and has 100 feet of closure. As at Dominguez, the Continental and the Standard have repressured the Seal Beach Field by injecting gas into the oil sands over a period of several years.

The productive sands in the Seal Beach Field are distributed through 3,600 feet of stratigraphic section and are grouped into five major oil zones. From top to bottom these are the Bixby, Selover, Wasem, Upper McGrath and Lower McGrath. The top of the Bixby zone is logged at 4,300 feet, top of the Selover at 4,550 feet, top of the Wasem at 4,870 feet and top of the McGrath at 5,920 feet. The Bixby, Selover and Wasem zones are located in the Repetto formation of Pliocene age, while the Upper and Lower McGrath zones are of Miocene age. Seal Beach has deep-zone possibilities, but will require the drilling of wells to great depths.

Inglewood

The Inglewood Field of Los Angeles Basin is located in the Baldwin Hills about 2½ miles northwest of the city of Inglewood and along the general line of folding that extends from Beverly Hills on the northwest to Newport in the extreme

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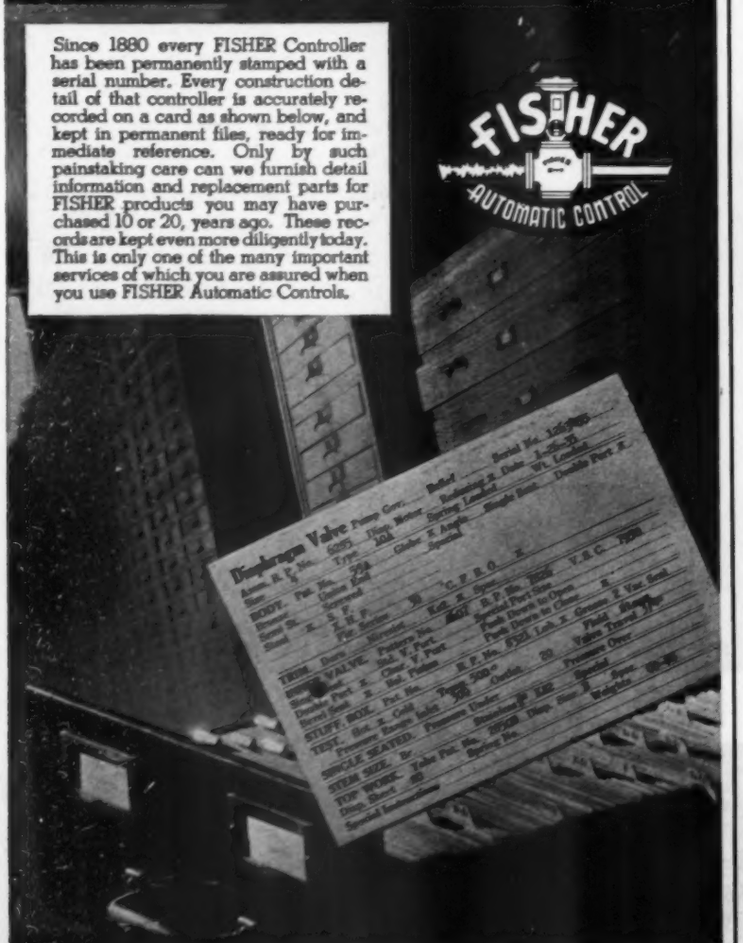

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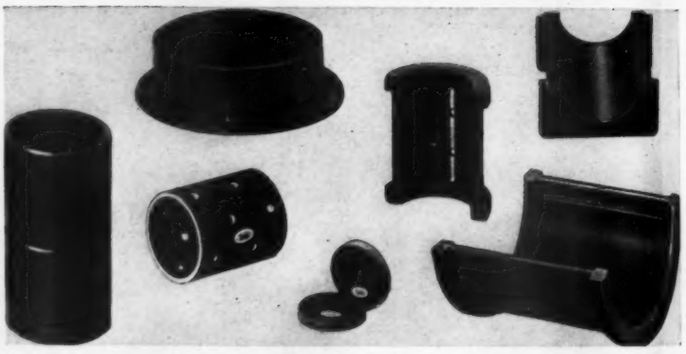

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southeast and along which are located the Beverly Hills, Inglewood, Potrero, Rosecrans, Dominguez, Long Beach, Seal Beach and Huntington Beach fields. The oil measures occur between depths of 1,200 and 4,000 feet, although the Standard Oil Co. in a deep test revealed the existence of another deep zone at approximately 6,000 feet in the Modelo formation of Miocene age. Operators are proceeding with development of the oil measures in the Repetto formation of Pliocene age.

This field is a definite reserve of a tangible nature and in addition has an intangible prospective reserve due to the possibility that deeper drilling will result in the discovery of additional productive zones. The Baldwin Hills comprise the most prominent topographic feature of a general uplift extending from Beverly Hills to Newport, as they rise to a height of approximately 300 feet above the surrounding plain. This group of hills forms a block, rectangular in shape, with steep escarpments on the north and west sides and a gentle slope on the east and south sides.

The Inglewood Field is an elongated dome approximately 2 miles long by 3,500 feet wide with the axis striking northwest-southeast and cut by a fault along its east edge with a smaller fold east of the fault. This fault has a throw of approximately 375 feet with a hade to the west. The crest of the structure lies approximately 1,150 feet below the ground surface, where the first oil showings are encountered. The oil bearing formations consist of alternating brown shales, sandy brown shales and oil sands. Productive measures at the crest have been developed through a thickness of approximately 3,000 feet.

Edgewater encroachment has become an important factor practically throughout the top zone and covers all but a small area at the apex of the structure. The Inglewood Field, although developed rapidly, has been drilled carefully and typifies the use of best engineering methods of oil field development. The areal limits of the field have been definitely determined and, although the depth and thickness of deeper productive measures remain to be determined, it is reasonable to expect that deeper drilling will result in the discovery of new productive zones.

Playa Del Rey

The Playa Del Rey Field is located 11 miles west of Los Angeles and apparently has no relationship to any other field in Los Angeles Basin except that it is one of three areas located in Echelon immediately adjacent to tidewater. These three fields are Playa Del Rey, Torrance and the recently discovered field at El Segundo. All three fields have a common characteristic in that the oil zones are located immediately above schist of the basement complex. The Playa Del Rey Field, which consists of low, marshy tidelands and a precipitous terrace in the Palisades or eastern end of the structure, is an elongated dome overlying a buried schist body with the axis of the structure extending in a northwest to southeast direction. The productive limits of the field have been determined, except that at one point in the southeastern end of the field additional acreage might possibly be found if there is sufficient kick in the reservoir to justify the drilling of wells.

In the older section of the Playa Del Rey Field, two productive zones were discovered, after completion of the Ohio Oil Co.'s discovery well, No. 1 Recreation Gun Club. The upper horizon, known as the Del Rey zone, was not present in the Palisades section of the field as it appears to terminate just west of the elevated area in the eastern section of the field. The lower, or Recreation zone, was productive throughout the field, although the productive formation was not uniform. In the older section of the field production was derived from a poorly sorted conglomerate, whereas in the Palisades or eastern end of the structure operators logged a normal oil sand. The Del Rey horizon is topped at approximately 3,600 feet and consists of a zone of alternating oil sand and shale with a thickness of approximately 100 feet. The Recreation zone is about 60 feet in thickness and topped at approximately 5,950 feet in the older section of the field and at about 6,300 feet in the Palisades area. Both the productive conglomerate in the older section of the field and the normal oil sand in the Palisades area rest immediately on top of schist. The thickness of the productive formation varies throughout the field, due probably to the fact that the schist was laid down unevenly.

Shallow producer drilled to 1,000 feet in Newhall Field, California, in 1876 by California Star Oil Co., predecessor of Standard Oil Company of California

Huntington Beach

The Huntington Beach Field of Los Angeles Basin, discovered by the Standard Oil Co., includes several producing areas, due probably to complex faulting, and consequently the structure does not show any uniformity of character. The subsurface horizons are so broken up that it is impossible to consider the area as a whole, although the stratigraphy of all the areas is similar and shows only minor variations in deposition. Oil in the Huntington Beach Field is accumulated in Tertiary rocks that have been folded into a domal anticline, although most of the folds are extremely complicated by faulting parallel to the trend of the main uplift and the axial direction of folding. The geologic age of the oil-bearing formations at Huntington Beach ranges from early Pliocene to middle Miocene of the Tertiary period. Most of the upper zones are of lower Pliocene Repetto formation, but deep zones in the old field, Barley Flats, Townsite and Surf areas are of Miocene age. The Pliocene is underlain by shale, including siliceous organic remains and some sand, forming a unit designated as the Puente or Modelo formations in Los Angeles Basin. This is of Miocene age and includes the deep productive zones in the Huntington Beach Field.

Deep zone possibilities of the Huntington Beach Field are of a questionable nature, although there is some evidence to support the expectation of developing deeper production. Development work in the Huntington Beach Field within the past two years has been unusual in a number of respects, the outstanding of which has been the drilling of slanted holes, as the result of which wells have been bottomed out beneath State tidelands. During the course of drilling operations the State of California negotiated leases with the operators involved contingent on the payment of future and back royalties and thus this work, which subsequently has been declared illegal, was validated at Huntington Beach by mutual agreement.

Richfield

The Richfield district of Los Angeles Basin is located in the northern part of Orange County, approximately 6 miles east of the city of Fullerton. Richfield is a steep asymmetric anticline in the Fernando group and consists of two separate productive areas located approximately 2 miles apart. The main part of the field is the westerly section discovered by the Union Oil Co., March 11, 1919, when No. 1 Chapman was brought in flowing 1,732 bbls. of clean 22.1 gravity oil per day from 3,025 feet. The eastern part of the Richfield district was discovered by the Standard Oil Co. several months prior to completion of the Union's discovery well in the western productive area. The Standard's discovery well was completed September 16, 1918, doing approximately 150 bbls. per day from 2,762 feet.

The oil zone in the east Richfield district is approximately 700 feet thick and is picked up at a depth of approximately 1,800 feet. The oil zone consists largely of shale, sandy shale and oil sand. Two productive horizons, the Chapman and Kraemer zones, exist in the west Richfield district. These zones are separated by a shale body about 250 feet thick. The top of the Chapman zone, which is about 500 feet thick, occurs at a depth of approximately 3,000 feet, while the top of the underlying Kraemer zone, which is about 400 feet in thickness, is encountered at 3,850 feet. Deep-zone possibilities in the Richfield district do not appear favorable.

Torrance

The Torrance Field of Los Angeles Basin, which did not experience the spectacular development that characterized work in the Long Beach, Huntington Beach and Santa Fe Springs fields, is located between the cities of Redondo Beach and Wilmington and about 18 miles south of Los Angeles. A topographic feature is a series of irregularly shaped low sand hills with elevations ranging from 25 feet to 125 feet above sea level. The surface formations are sands and gravels of Quaternary age which lie unconformably upon the Fernando group of Pliocene age. The structure is an anticline which plunges to the southeast and which is broken at several points by a series of minor faults.

Although gas was produced along with crude oil during development of the Torrance Field, no gas zone separate and distinct from the oil-producing measures was found in the field. Technically, only one productive horizon was found in the Torrance Field, although in areas dominated by faulting the oil sand was separated by a thin shale body. The oil sand in this field averages around 400 feet in thickness and is encountered at 2,650 feet. The Torrance Field produces a crude which varies from a minimum gravity

R. T. Herndon, vice president, Texas Co. (California)

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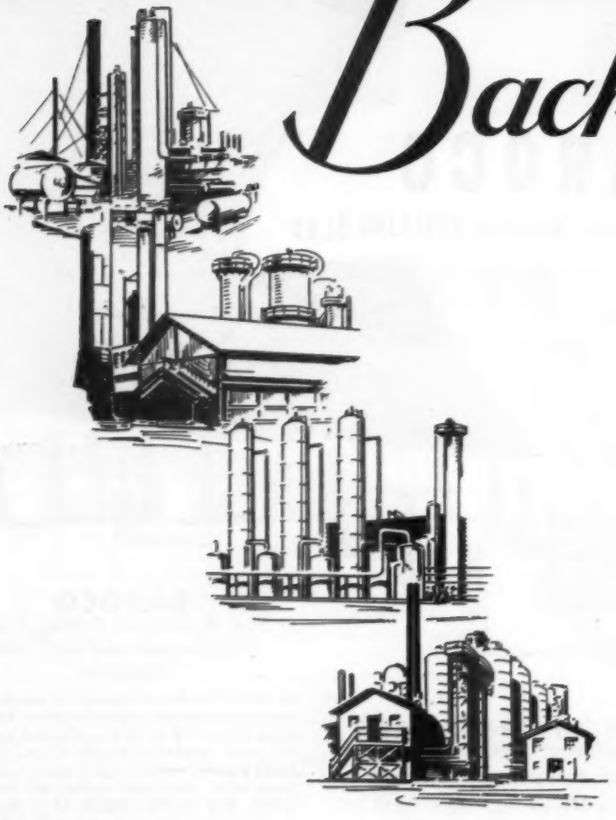

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of 12 degrees A.P.I. to a maximum of 20 degrees A.P.I. and shows variation in content of gasoline, naphtha and sulfur, depending on the location of wells with respect to the cross fault. Possibility of developing deep-zone production in the Torrance Field appears unfavorable.

Brea Canyon

The Brea Canyon Field of Los Angeles Basin is located on the Whittier fault, which skirts the southern flank of the Puente Hills and which can be followed by surface indications from where these hills terminate and across the San Gabriel area to the Santa Ana Mountains. The Brea Canyon Field derives its name from Brea Canyon, which cuts through the hills and enters La Habra Valley and in which many outcropping oil sands are exposed by the Whittier fault. The area is one of pronounced disturbance as indicated by anticlinal foldings, flexures and faulting. Production in this field is obtained from both the Fernando and Puente formations from an oil sand having a thickness of approximately 200 feet.

The Olinda Field has the largest areal extent of any field located on the Whittier fault, as it contains 1,076 acres of productive oil lands. The field is anticlinal in structure, with the major folding occurring north of the productive area and minor folding within the area of production. Production is obtained in the Fernando beds and the oil-bearing formations are encountered from the top to the bottom of the Fernando in what must be considered one continuous oil zone. The Puente Field, which is generally considered as a component part of the Brea Olinda Field, comprises approximately 160 acres and is located on the same anticlinal fold as the Whittier Field, which diverges from the strike of the Whittier fault. The axis of the Puente anticline is exposed and production is obtained on both flanks. Production is obtained from the lower Puente formation, which is the deepest horizon produced in the Miocene in Los Angeles Basin with the exception of Playa Del Rey, in which deep production was developed in the San Onofre or Topanga conglomerate corresponding to the Temblor. The oil sand is picked up at approximately 1,400 feet and is about 500 feet thick, although this varies throughout the field.

The Rosecrans Field of Los Angeles Basin is approximately 10 miles south of Los Angeles and is rather unique due to the rapid decline of production and the unusually rapid encroachment of edgewater. The field consists of three separate structures within an area 2 miles long by 2,000 feet wide and is located along the general line of uplift extending from Beverly on the north to Newport on the south. The three divisions of the field are designated as the Athens area, the Central area and the Main Street area. The field was named in honor of General Rosecrans, who served in the United States army during the Civil War and who purchased a ranch in this district in 1870. Several productive zones were found as a result of development and every indication points to the possible existence of additional deeper zones. As a matter of fact, wells drilled by the Barnsdall on the Trust lease indicate rather conclusively at least one additional productive zone.

S. A. Guiberson, Jr.,
Guiberson Oil Co.

Santa Fe Springs

The Santa Fe Springs Field is approximately 12 miles east of Los Angeles in the central part of Los Angeles Basin. It is a symmetrical elongated dome with about 800 feet of closure and occupies an area slightly higher in elevation than the surrounding country. This topographic feature resulted in its discovery, although the main part of the field was not found until several years after the initiation of exploratory work out in the extreme eastern edge of the structure. The axis is a continuation of the Coyote Hills uplift and is separated from the West Coyote Field by a structural saddle. Highly productive oil zones and one gas zone were encountered in the Santa Fe Springs Field, but all of them are in an advanced stage of depletion. The gas zone, which is 1,500 feet thick and consists of sands, sandy shales and shale, is encountered at about 2,000 feet. The Foix zone, which has an average thickness of approximately 180 feet, occurs at a depth of approximately 3,500 feet. The Bell zone, 190 feet below the Foix zone, has an average thickness of 370 feet, the upper 200 feet being the productive portion of the zone. The Meyer zone, 325 feet below the Bell zone, is about 850 feet thick. The Nordstrom zone is encountered at a depth of approximately 5,000 feet and is about 550 feet thick. The Buckbee zone is about 1,500 feet below the top of the Meyer zone and is encountered at about 5,700 feet. It is about 170 feet thick. The O'Connell zone has a thickness of about 475 feet and occurs at a depth of approximately 6,350 feet. Beneath the O'Connell zone, production is developed in what was classified as an upper Clarke zone and a lower Clarke zone. Deep zone possibilities in the Santa Fe Springs Field are considered excellent, although operators may find it necessary to drill to extreme depths.

California Crude Oil Production—Probable Ultimate Recovery—Amount Shut In

NORTHERN FIELDS—	Date discovered	Proved acreage	Recovery per acre to date	Production to Aug. 31, 1935	Remaining to be recovered	Estimated ultimate recovery	Daily production— Current	Shut in	No. of productive zones	Depth to first zone	Grav. of oil °A.P.I.	Oil wells— Prod.	Shut in	Idle
Coalinga	1895	15,966	21,203	336,520,585	86,479,415	425,000,000	21,287	13,525	3	700	13–32	981	419	116
Edison	1924	1,080	557	557,188	14,442,812	15,000,000	3,700	3,075	2	1,200	15–25	44	....	2
Elk Hills	1919	5,850	22,906	133,998,717	91,001,283	225,000,000	9,396	8,350	2	2,500	25–38	167	140	7
Fruitvale	1928	1,250	6,539	8,173,977	16,826,023	25,000,000	6,371	5,050	1	3,500	22	76	4	4
Kern River	1899	10,150	29,499	299,415,125	75,584,875	375,000,000	12,859	9,410	1	1,800	12–16	1,537	973	116
Kettleman Middle Dome	1932	1,280	251	321,755	114,678,245	115,000,000	.....	3,000	1	8,300	56	....	2	....
Kettleman North Dome	1928	17,610	6,010	105,831,853	1,144,168,147	1,250,000,000	99,463	200,000	2	7,100	35–60	112	24	1
Lost Hills-Belridge	1910	5,500	14,337	78,855,427	221,144,573	300,000,000	16,198	45,200	3	400	12–45	526	215	31
Maricopa	1894	16,950	9,768	165,573,190	59,426,810	225,000,000	13,399	3,750	1	2,000	12–28	690	175	80
McKittrick	1898	1,715	48,294	84,669,145	15,330,855	100,000,000	4,069	1,350	1	1,000	15	218	74	80
Midway	1901	28,650	21,443	614,248,165	285,651,835	900,000,000	46,491	25,150	1	1,800	12–27	1,823	831	207
Mountain View	1933	1,300	5,613	7,403,746	42,596,254	50,000,000	39,322	50,000	2	5,300	26–29	96	....	7
Mount Poso	1926	1,500	14,362	21,543,258	98,456,742	120,000,000	20,019	29,050	2	1,500	16	208	27	....
Round Mountain	1927	1,050	6,579	6,907,944	43,092,056	50,000,000	9,190	10,800	2	2,000	15–21	72	8	1
Wheeler Ridge	1922	320	9,906	3,170,055	2,329,945	6,500,000	455	.....	1	2,000	23	35	....	....
Total Northern		110,091	16,889	1,869,290,130	2,312,209,870	4,181,500,000	302,219	407,710				6,585	2,892	653
COASTAL FIELDS—														
Capitan	1929	140	4,252	595,318	9,404,682	10,000,000	1,864	2,250	2	1,200	20–43	15	8	....
Elwood	1928	500	105,159	52,579,645	72,420,355	125,000,000	12,831	11,350	2	3,400	34–39	50	29	6
Goleta	1927	.....	.....	136,151	(None)	136,151	(Field Abandoned)		..	....	42	....	....	....
Rincon	1927	250	25,033	6,258,128	8,741,872	15,000,000	2,198	300	2	2,500	20–30	30	4	9
San Miguelito	1931	250	4,432	1,108,215	13,891,785	15,000,000	776	1,450	1	6,800	29	4	....	1
Santa Barbara	1929	75	26,665	1,999,902	1,500,098	3,500,000	2,519	1,500	1	2,100	18	65	....	4
Santa Maria	1901	10,687	12,391	132,425,100	92,574,900	225,000,000	4,750	10,150	2	1,800	11–25	206	211	6
Summerland	1894	50	62,940	3,102,986	197,014	3,300,000	40	.....	1	1,000	12–17	19	....	41
Ventura Avenue	1918	1,750	89,613	157,718,789	132,281,211	290,000,000	26,677	31,300	4	2,250	28–31	212	89	12
Ventura-Newhall	1875	4,685	11,410	53,455,837	21,544,163	75,000,000	4,150	1,850	Various	1,000	12–38	536	94	132
Watsonville	1878	50	27,774	1,388,688	111,312	1,500,000	60	.....	1	750	35	7	....	1
Total Coastal		18,447	22,268	410,768,759	352,667,392	763,436,151	65,565	60,650				1,144	435	214
SOUTHERN FIELDS—														
Brea Olinda	1880	1,750	87,424	152,992,651	47,007,349	200,000,000	10,964	7,425	2	1,500	13–27	370	117	25
Coyote (East and West)	1909	2,000	71,252	142,505,181	107,494,819	250,000,000	14,085	15,350	3	3,300	17–31	135	132	14
Dominguez	1923	675	110,818	74,802,372	150,197,628	225,000,000	20,979	41,900	6	4,000	25–32	92	75	3
Huntington Beach	1920	2,000	113,777	227,553,595	87,446,405	315,000,000	42,745	19,850	3	2,000	13–26	486	163	127
Inglewood	1924	575	109,315	94,975,223	255,224,777	350,000,000	12,169	11,600	3	2,500	17–29	215	61	4
Lawndale	1928	25	37,383	934,575	315,425	1,250,000	115	.....	1	5,800	30	7	....	1
Long Beach	1921	1,000	338,821	542,114,236	157,885,764	700,000,000	77,599	.....	5	2,800	22–29	1,242	....	282
Los Angeles	1892	500	52,736	26,368,006	231,994	26,600,000	700	.....	1	1,000	14	109	....	19
Montebello	1917	1,150	82,902	96,487,365	103,512,635	200,000,000	6,615	2,050	3	3,500	17–38	181	34	3
Newport	1923	.....	.....	129,120	20,880	150,000	.....	.....	..	....	10	....	....	3
Playa Del Rey	1929	450	69,636	31,336,201	18,663,799	50,000,000	17,377	3,000	2	3,600	23	199	15	21
Potrero	1928	75	26,816	2,011,222	488,778	2,500,000	336	.....	2	4,600	35–47	11	....	7
Richfield	1919	1,450	52,834	76,594,535	23,405,465	100,000,000	7,594	3,150	2	2,250	18–25	248	56	8
Rosecrans	1924	400	75,124	30,049,559	9,950,441	40,000,000	2,494	1,000	5	4,350	30–40	76	19	12
Salt Lake	1902	500	76,770	38,384,894	1,115,106	39,500,000	100	100	1	2,800	16	19	2	3
Santa Fe Springs	1919–21	1,950	202,627	395,122,130	84,877,870	480,000,000	54,292	7,725	8	3,200	28–35	667	55	34
Seal Beach	1926	440	161,488	71,054,538	28,945,462	100,000,000	5,964	4,050	4	4,400	25–29	109	32	9
Torrance	1922	4,000	19,844	79,377,383	20,622,617	100,000,000	6,739	1,450	2	2,400	14–25	488	86	76
Whittier	1898	600	27,523	16,513,846	3,986,154	20,500,000	1,155	115	1	1,800	16–28	161	21	9
Total Southern		20,440	102,696	2,099,106,632	1,101,393,368	3,200,500,000	284,962	118,905				4,815	858	795
Total State		148,978	25,395	4,379,165,521	3,766,270,630	8,145,436,151	652,746	587,165				12,544	4,185	1,673

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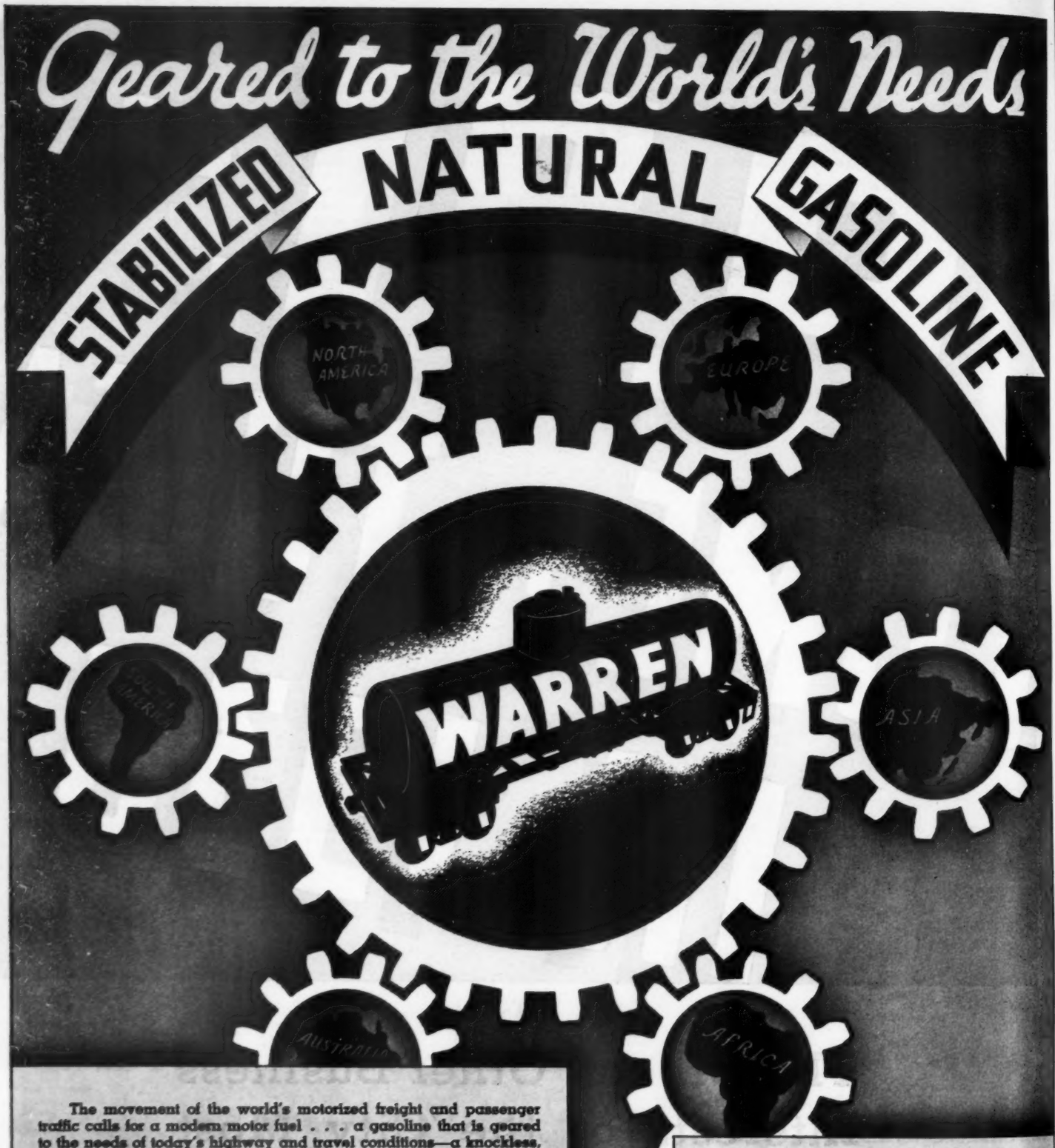

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Intensive Exploration for Natural Gas Over Past Two Years in California

By N. A. ROUSSELOT
Manager Field Operations, Milham Exploration Co.

The principal source of natural gas in California has been gas produced with oil from oil wells. Until recent years there has been an abundant supply of gas from this source so that little interest was manifested in exploration projects for natural gas alone—the quest being for oil.

Prior to the discovery of Kettleman Hills in the latter part of 1928, the natural gas market in California was limited to the southern California area. Gas for this market was supplied from the Los Angeles Basin oil fields, Ventura Avenue, Buena Vista and Elk Hills in the San Joaquin Valley. In the latter case a good portion of the gas was taken from a dry gas horizon found above the oil measures.

The development of Kettleman Hills with wells producing 75,000,000 to 150,000,000 feet per day with a small amount of light gravity crude oil caused the expansion of the natural gas market in the San Francisco Bay region and the northern California area. Two 22-inch lines and one 10-inch line were built into Kettleman Hills to supply this northern California district, and one 20-inch and one 26-inch line to the southern California area from this field.

Kettleman Hills Main Source

With the decline of the flush fields in southern California and the near extinction of that source of natural gas supply, Kettleman Hills became the largest source of supply of the state until it now supplies more than 50 per cent of the total natural gas market.

These circumstances brought about the rather unique condition in California—that of a rather intensive search for natural gas over the past two years. This exploration work was concentrated, for the most part, in the San Joaquin Valley Basin and was carried on by the use of geophysical methods—principally seismograph surveys. Some of the known geologic structures on the rim of the basin which had previous indications of gas were also tested. At the present time there are seven areas in the San Joaquin Valley and one on the coast which show promise of becoming natural gas fields. These are listed as follows: Tracy, Semi-Tropic Ridge, Chowchilla (Merced), Delano (Trico) area, Buena Vista Lake, Dudley Ridge, Goleta (More ranch), and Buttonwillow.

Tracy Area

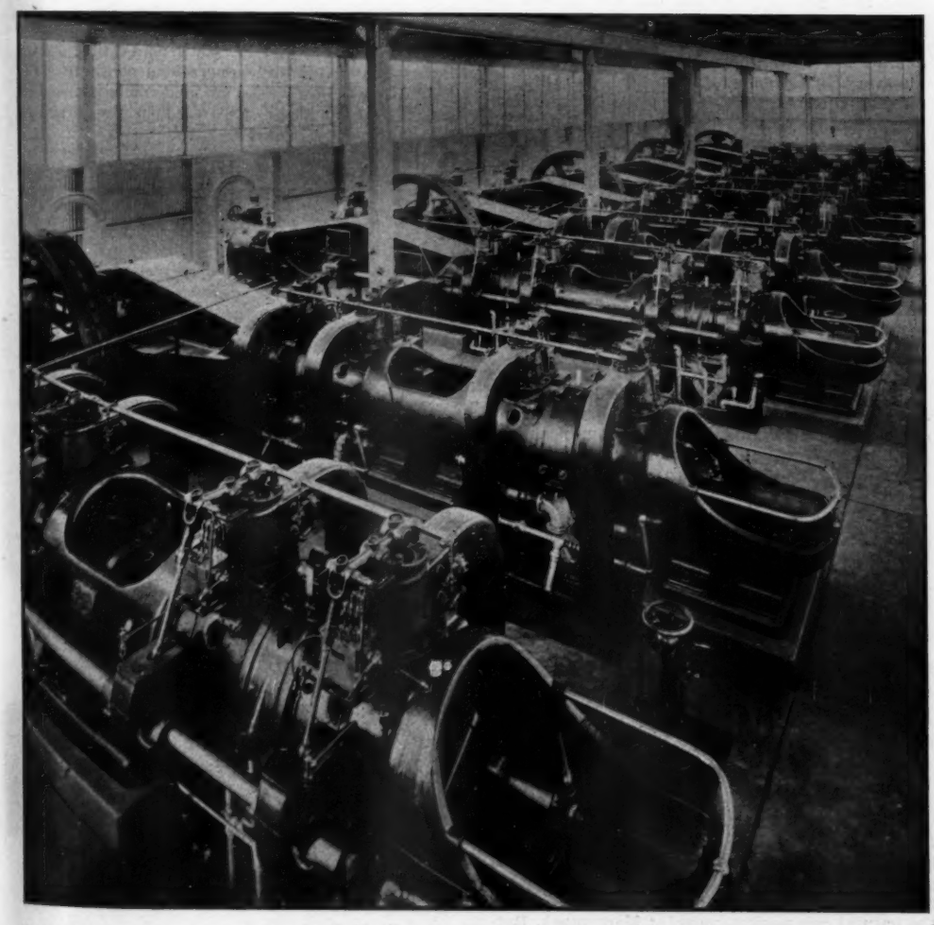
The Tracy area is located in the extreme northwest portion of the San Joaquin Valley about 20 miles southwest of Stockton near the town of Tracy. It was located by a seismograph survey carried on by Amerada Petroleum Corp. of California which company drilled the discovery well in Section 15, Township 2s, Range 5e. The well was completed on August 11, 1935, for a production of 35,000,000 feet per day with 1,400 pounds flow pressure from a depth of 4,063 feet. The production was obtained in this well from 60 feet of sand in a 350-foot sand zone in the Upper Cretaceous formation.

The extent of the field is yet undefined but the thickness of the sand, porosity and pressure on the sand indicate that a rather large per acre yield might be expected.

Semi-Tropic Ridge

The Semi-Tropic Ridge is a low topographic swell on the west side of the southern San Joaquin Valley, its center being about 35 miles northwest of Bakersfield. It has long been considered a prospective gas area due to showings encountered in previous wildcat wells drilled in the area. Its structural features were studied by seismograph surveys and core drilling previous to its discovery.

The field was discovered by Standard Oil Co. of California when on March 8, 1935, that company completed its No. 1 Hill located in Section 8, Township 27s, Range 23e, for an initial production of about 100,000,000 feet per day at a depth of 3,183 feet from the San Joaquin clay series of the Upper Pliocene. Subsequent work in this field during the past six months has resulted in the discovery of an upper zone at 2,400 feet which has proved more extensive than the lower Hill zone. Wells in the upper zone range in volume from 2,000,000 to 35,000,000 feet. There have been 18 wells completed in the field since its discovery, indicating an areal extent of about 3,000 acres. The sand thickness of the upper zone (Mya zone) varies from 2 to 14 feet. The extent of the lower Hill zone has, to this writing, been confined to an area less than 640 acres. The indicated production per acre to be expected from this field is 5,000,000 feet. Due to a change in the lithologic character of the sediments through the area there is a strip of land about 1 mile wide running across the axis of the structure at its apex which is not productive in the upper zone.



Interior of Pacific Gas & Electric Co.'s Kettleman Hills compressor plant. Equipment consists of five 760-horsepower Cooper gas engines

Trico Area

The Trico area is located near the center of the San Joaquin Valley about 40 miles northwest of Bakersfield. The structure was located by a seismograph survey. The initial production came from Trico Oil & Gas Co.'s No. 2, located in Section 3, Township 25s, Range 23e, on November 18, 1934, with a flow of 2,000,000 feet per day from a depth of 2,475 feet. The production is found in the top of the San Joaquin clay series in the Upper Pliocene sediments. The Standard Oil Co. of California completed its No. 1 Title Guarantee & Trust, located in Section 1, Township 25s, Range 23e, from the same zone on February 13, 1935, for a flow of 28,000,000 feet. However, little success has followed subsequent drilling operations which indicates that the productive area is spotted and may not be extensive.

Buena Vista Lake

This area is located about 18 miles southwest of Bakersfield. It was located by a seismograph survey and discovery made by the Ohio Oil Co. in its No. 1 Kern County Land Co., located in Section 31, Township 31s, Range 26e. The well was drilled to a depth of 7,957 feet but the discovery was made between 5,180 and 5,239 feet from a sandy shale zone in the Pliocene formation. The well on completion made 7,800,000 feet per day through a one-thirty-second inch bean, shutting in at 2,240 pounds. In all four horizons were indicated from formation tests of this well

A. B. Macbeth, president, Southern California Gas Co.

with an average sand thickness of 20 feet. As there have been only two wells drilled in this area the extent of the field is not yet known but present indications are that its areal extent is 3,000 acres.

Chowchilla (Merced) Area

This area is located in the center of the North San Joaquin Valley 14 miles south of Merced. The area was located by a seismograph survey carried on by the Pure Oil Co. The discovery well, No. 1 Chowchilla, located in Section 7, Township 10s, Range 14e, was drilled by Pure Oil Co. to a depth of 8,244 feet. Production was obtained from the Cretaceous formation between 7,765 and 8,030 feet at the rate of about 20,000,000 feet per day. There has been no further development to date to determine the extent of this area.

Dudley Ridge (Tulare Lake District)

This area is located on the southwestern edge of Tulare Lake just east of the southeastern end of Kettleman Hills. For many years shallow wells drilled in this area encountered good showings of gas but the first well which encountered commercial production was J. E. O'Donnell's No. 1 Dudley, located in Section 12, Township 23s, Range 19e, which was completed on May 24, 1929, for an estimated flow of 25,000,000 feet from 1,225-40 feet in the upper part of the Tulare formation.

There have been 15 or 20 additional wells put down in this area in an effort to develop a commercial dry gas field but the wells which are put on production drop in pressure and volume rapidly to a point where they cease to yield gas in commercial quantities. At present there are no wells in this area capable of commercial production although some completions have been rated as high as 50,000,000 feet per day. A topographical indication of a ridge led to the discovery of this area.

More Ranch Field

This field lies on the coast about 10 miles west of Santa Barbara. General Petroleum Corp. discovered this field on September 19, 1929, with the completion of its No. 1 More with a flow of 40,000,000 feet. The production comes from 350 feet of sands in the Vaqueros (Lower Miocene) formation from an average depth of 4,300 feet. The indicated area of this field is 200 acres with four producing wells.

Buttonwillow Field

The Buttonwillow Field is a low topographic ridge on the west side of the southern San Joaquin Valley about 30 miles northwest of Bakersfield and generally paralleling the Semi-Tropic Ridge located 5 miles to the north. The topographic expression was the incentive for a core drilling survey of the area which resulted in its discovery by Milham Exploration Co. with the completion on August 4, 1927, of its No. 1-A Kern, located in Section 8, Township 28s, Range 23e. Production was obtained from a sandy shale zone about 150 feet thick at the base of the Tulare formation with a flow of 16,000,000 feet per day from a depth of 2,500 feet. Subsequent development has resulted in 30 successful completions with four commercial gas zones indicated in a proven area of 2,400 acres. The production from three of the zones is found in 10 to 20-foot sand bodies and the fourth the 150 feet of sandy shale found in the discovery well.

Gas Almost All Methane

The natural gas from the gas fields in the San Joaquin Valley is almost all methane with an average heat unit value of 1,000 B.t.u. per cubic foot. The following analysis of Buttonwillow gas is typical of the other areas:

	Per cent
Air	0.0
Carbon dioxide	0.2
Methane	99.8
Ethane and heavier	0.0
Specific gravity (Edward's balance)	0.565
Gross heating value, B.t.u. per cu. ft.	1015

The following is an estimate of the natural gas reserves of the state:

	Feet
Natural gas reserves in oil fields	4,000,000,000,000
Natural gas from present proven and indicated natural gas fields	250,000,000,000
Total	4,250,000,000,000

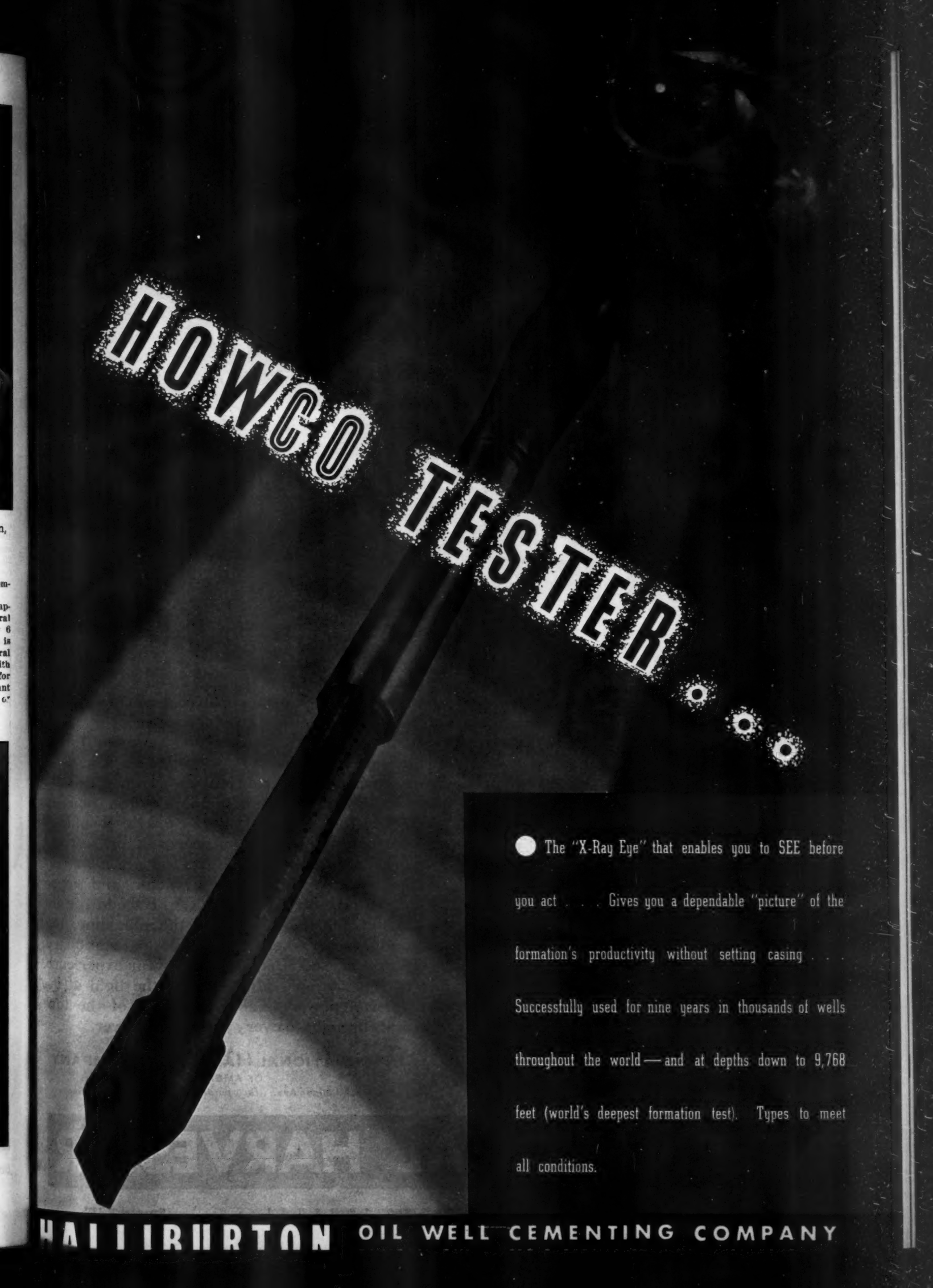
Summing up natural gas production in California, there are three natural gas fields which have been developed sufficiently for commercial production at present either supplying gas or capable of supplying gas in commercial quantities to the natural gas market, namely: More ranch, Buttonwillow and Semi-Tropic. Of the remaining areas described above, only the Tracy area and Buena Vista have present indications of developing commercial production of natural gas.

It may be seen from above figures that approximately 94 per cent of the present natural gas reserves are found in oil fields and only 6 per cent in natural gas fields. Furthermore, it is estimated that 70 per cent of the state's natural gas reserve is found at Kettleman Hills. With the present exploration operations continuing for natural gas, however, new and more important gas fields should be discovered in the basin of the San Joaquin Valley.

J. A. Jones, superintendent of production, Associated Oil Co.

R. W. Hanna, vice president, Standard Oil Co. of California

F. C. Ripley, general manager, Chanslor-Canfield Midway Oil Co.



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California Natural Gasoline Production Registered Slow, Persistent Decline

By L. P. STOCKMAN

Natural gasoline production, reflecting the failure of prospectors to discover new prolific oil fields and a gradual but consistent decline in the production of older areas, has shown a declining tendency during the past several years. Kettleman Hills, Ventura Avenue and North Belridge hold the key to future production during the next several years. The dependence of operators on these fields to meet the consumptive demand for crude and refined oil will be the dominating factor in the production of natural gasoline. Simultaneous development of Long Beach, Santa Fe Springs and Huntington Beach a few years ago resulted in the production of an excessive amount of natural gasoline and for a limited period some of the surplus was shipped to the Atlantic seaboard for domestic consumption or moved in the export trade to foreign countries. During the past several years, however, production has shown a consistent drop and at the present rate may go below normal requirements within another year unless operators holding productive acreage in highly prolific fields substantially increase crude oil production.

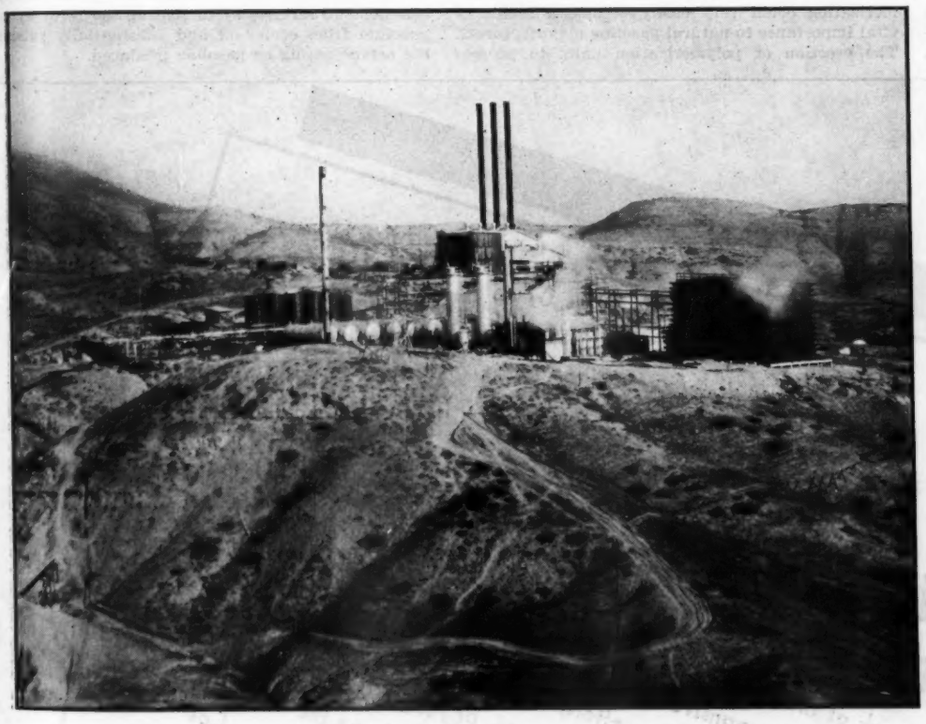
The magnitude of reserves in the three principal fields mentioned above is ample to meet normal requirements for natural gasoline during the next few years and maintain California's position as a major producer, but since the amount of natural gas produced and natural gasoline recovered therefrom depends upon the rate of crude oil production, it is quite obvious that production activities in the Kettleman Hills, North Belridge and Ventura Avenue fields will determine the amount and rate of natural gasoline production. We may have temporary peaks of short duration but in the final analysis we must rely on major primary fields for the greater part of production during the next several years. It is not at all improbable that some of the dry gas fields of the State may substantially reduce the production of natural gas from oil fields and if this development materializes it is evident that production of natural gasoline will be vitally affected. In order to meet Pacific Coast requirements it is not necessary to blend to the extent that it necessary where climatic conditions are less favorable during the winter months, but at the same time marketers are consistently demanding a stablized product and several companies are buying natural gasoline on a graduated scale based on vapor pressure at 100 degrees Fahrenheit.

Pressure Storage Used

In California, production of oil and its corollaries, natural gas and natural gasoline, is limited to a relatively small area divided into three well defined basins and this geographical condition has resulted in the laying of several pipe lines used exclusively for the transportation of natural gasoline to tidewater or refining centers. These pipe line facilities have proved advantageous to the natural gasoline manufacturer because he is enabled to reduce storage facilities to a minimum and avoid evaporation losses by installing closed tankage of the pressure type. Refiners, recognizing the benefits of this method, have also installed pressure storage facilities at the point of reception. With the advent of rectification and the economic advantages accruing to centralization of this operation under control of refining companies, a firm market has developed for unrectified or partially rectified natural gasoline. As a matter of fact, a considerable portion of natural gasoline produced in California is sold to refining companies in an unrectified or partially rectified condition. Approximately 85 per cent of present production of natural gasoline is handled through completely closed systems of pressure storage, transportation and reception in California at the present time.

Curtailment of crude oil production during the past few years and the normal decline in productive fields has exerted a very pronounced effect on the production of natural gasoline. Coincident with this restriction and a normal decline in production, natural gasoline plant operators were confronted with the necessity of either suspending operations or centralizing the scope of work. As a result, the number of operating plants in California has shown a substantial reduction during the past five years. During January, 1930, there were 138 natural gasoline plants operating in California, but the number declined to 135 in January, 1931, and to 121 in January, 1932. During the month of January, 1933, the number of natural gasoline plants in operation dropped to 104 and declined to 102 in January, 1934, and 93 in January, 1935. During the month of August, 1935, the number had declined to 89. Many of the plants installed during the period of peak production have either been dismantled or have become antiquated because of the development of more modern equipment and increased efficiency of operation.

Although the immediate outlook of the natural gasoline industry is not any too bright, we must assume as a logical expectation, due to increased exploration and a more general use of geophysical work, that new fields will be discovered in California from time to time during the next several years. Discovery of these new fields will necessitate the erection of new gasoline plants and, while some of the materials may be salvaged from plants now idle, it is quite probable that improved design and changed marketing conditions may limit the use of salvaged equipment to a minimum. The design of absorption towers will probably not change to any material extent, but some improved method will undoubtedly be developed to thoroughly scrub wet and dry gases in order to conserve absorption oil and reduce the clogging and gum-forming effect of oil in regulating equipment. Preheaters and heat exchange equipment should undergo minor improvements and fractionating stills consisting of a separate stripper and fractionator or a unitized stripper and fractionater will probably continue in use. One of the most important possibilities of future plant design is the general use of automatic control devices, which should tend to increase operating efficiency and permit more efficient remote control and a better supervision of plant operation.



Absorption plant in Kettleman Hills Field, Kings County, California

Vapor Recovery Plants

The constantly increasing tendency toward higher compression ratios in automobile engines has been reflected to a marked degree in the utilization of natural gasoline. During the period when low compression was the rule rather than the exception, it appeared quite probable that the use of natural gasoline would permit the manufacture of an ideal motor fuel without the necessity of deep cracking by refiners and thereby permit the use of substantial quantities of natural gasoline for blending purposes. At the present time refiners are cracking quite deep into the charging stock and the natural gasoline industry is confronted with what may ultimately become a formidable competitor as the result of the construction of vapor recovery plants. Vapor recovery gasoline has not yet become of major importance but may become indispensable from an economic standpoint due to the reforming of gasoline.

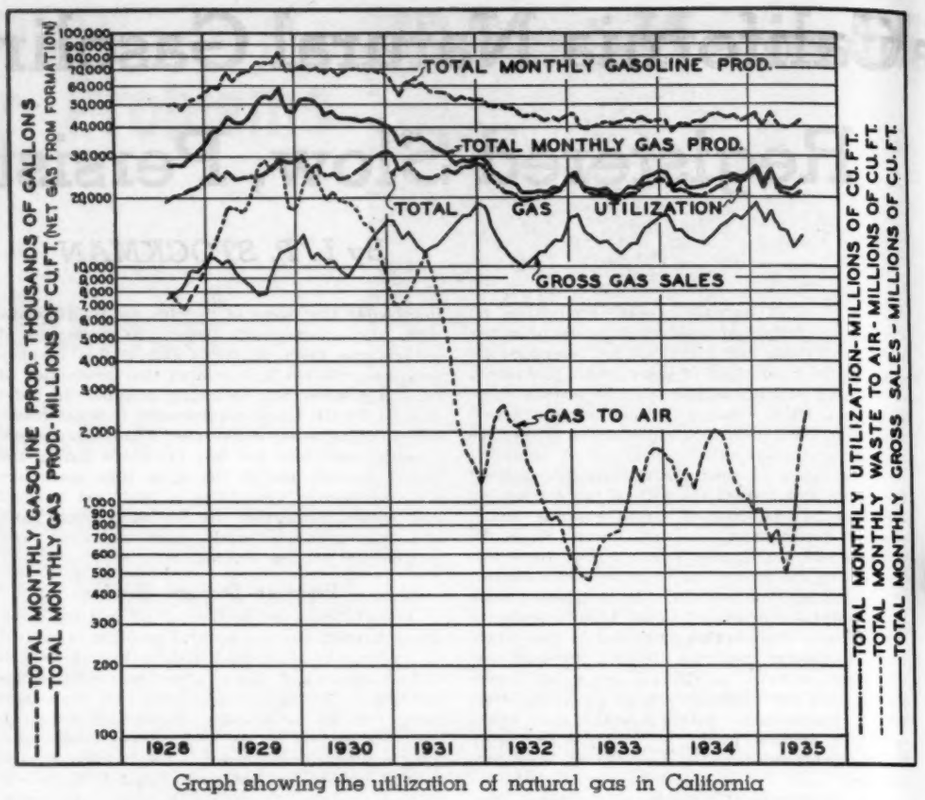
Although production of natural gasoline in California, which totaled 1,061,876 bbls. during August, 1935, as compared with 1,661,887 bbls. during January, 1930, has reached a low ebb and is confronted by several disturbing elements, it appears

quite probable that the price range should remain above that prevailing in the Texas and Mid-Continent areas and experience a normal demand during the next few years. Natural gasoline should continue as a component part of motor fuel due to its volatility, susceptibility to tetraethyl lead and favorable antiknock value, which makes it a satisfactory blending factor. Obsolescence of automobiles and probable replacement with new models which show a higher rate of consumption should tend to maintain a normal market for natural gasoline despite other unfavorable factors. After being properly rectified, natural gasoline has been blended as high as 30 per cent by volume in finished motor fuel sold on the Pacific Coast.

Rectification Operations

Subsequent to and as a result of rectification operations, operators turned their attention to the development of liquefied gas, and application of butane to meet fuel requirements of automotive equipment and in other lines of endeavor is growing in importance. The use of propane-butane as motor fuel reduces crankcase dilution to a minimum and enhances lubricating oil economies and as it burns cleanly with no carbon formation and reduces engine maintenance, it is growing in favor. It would seem probable, however, despite its efficiency from an operating standpoint, that this field would be rather limited during the next few years. California operators can produce approximately 100,000 gallons of liquefied petroleum gas per day and from present indications production during 1935 should be somewhat in excess of the 11,536,140 gallons produced during 1934 and 6,744,276 gallons produced in 1933.

Polymerization, which is at the present time undergoing considerable research, may vitally affect the natural gasoline industry although it is quite probable that extensive application of polymerization to natural gas in the field is still some time in the future. In fields producing large quantities of wet gas, polymerization units may augment or replace a part of existing equipment and if present experimental research results in the development of a process that can utilize methane, polymerization units will then be erected in fields having an adequate supply of natural gas and turn out an excellent finished motor fuel. Polymerization could very easily become a factor of vital importance to natural gasoline manufacturers. The erection of polymerization units to process natural gasoline in the field would probably prove beneficial to natural gasoline manufacturers, but at the same time polymerization will prove equally beneficial to refiners by increasing the recovery of gasoline from crude oil and substantially raising the octane rating on gasoline produced.



Graph showing the utilization of natural gas in California

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Wide Use of Liquefied Petroleum Gas Increasing in Pacific Coast Territory

By G. H. MONTFORT
Consulting Engineer, American Liquid Gas Corp.

There are two sources from which liquefied petroleum gases may be obtained: First, from the natural gas as it is treated in the natural gasoline plants, and second, from the gases given off from crude oil during the refining processes.

When natural gas flows from the well it contains mixtures of several substances which the chemist calls "hydrocarbons," consisting of combinations of carbon and hydrogen which vary in consecutive order, beginning with CH_4, that is, one molecule of carbon and four molecules of hydrogen, and known as methane gas. There are five other gases in this series, which are ethane (C_2H_6), propane (C_3H_8), butane (C_4H_{10}), pentane (C_5H_{12}), and hexane (C_6H_{14}), and heavier. There are other arrangements of atoms in the molecules of some of these gases and are so arranged as to give slightly different characteristics as in the case of butane, which may be split up into normal butane and isobutane. When the natural gas comes from the well and also the gas from the refining process of crude oil, it contains minute particles of liquid. These particles are extracted from the gas and constitutes the natural gasoline, butane, propane, etc. The density of the particles, or in other words the wetness of the gas, determines the amount of gasoline and gas which may be liquefied from each 1,000 cubic feet of the gas put through the extraction plant, and usually ranges from three-tenths of a gallon to 8 gallons per thousand cubic feet.

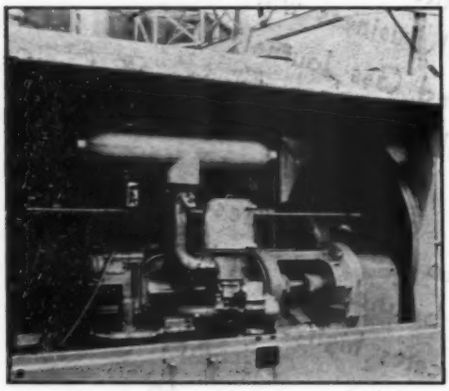


Photo No. 1—Butane installation on a caterpillar tractor after change from gasoline

There are large quantities of wet gas available in the San Joaquin Valley, especially at Kettleman Hills, and also in the Los Angeles Basin, of which only a small portion is at present processed for the extraction of liquefied petroleum gases. Gas has been used for years as a source of natural gasoline; originally the gases came from the tops of the casing of oil wells and the gasoline separated from these gases was called casinghead gasoline. It is only within the last four years that this gasoline has become commonly known as natural gasoline to distinguish it from the gasoline made from crude oil in the refineries.

There are three well-known processes for separating the natural gasoline from the natural gases: (1) By dissolving under pressure in an oil which is specially adapted to absorbing the gases and from which the gases could be later separated by distillation; (2) by compressing the gases under sufficient pressure to liquefy them and also by a combination of compression and cooling; (3) by absorbing the gases in a porous material, such as powdered charcoal, from which it could be subsequently driven off by steam.

In all the methods of separating the natural gasoline from the petroleum gases, the higher hydrocarbons, such as pentane and hexane, which were separated as gasoline, are accompanied by quite a percentage of the lower hydrocarbons, such as propane and butane. These lower hydrocarbons were not wanted in the gasoline, as they made it too volatile, and the method originally used to get rid of these undesirable gases was to "weather" the gasoline. This "weathering" process was simple, as all that was necessary was to allow the dissolved propane, butane, etc., to escape until the natural gasoline was stable enough to handle in ordinary containers.

It was finally discovered that in this weathering process a large percentage of gasoline vaporized and escaped along with the more volatile gases, and in order to prevent this, the wild natural gasoline, as it comes from the absorption plant, was subjected to fractional distillation, which is the process used in the chemical industry for separating liquids of different boiling points which occur together in a solution. This process of separating the volatile gases from the natural gasoline is commonly known as stabilization. This stabilization is accomplished by heating and boiling off the most easily vaporized gases. The system can be controlled by regulating the temperature and pressure to cause the propane and butane vapors to liquefy when they reach an upper portion of the stabilizing column (See diagramatic sketch, Figure 1).

Figure 1 shows the most commonly used process for the recovery of butane and propane. The rich gases and oil from the oil and gas well flow into a gas trap which separates the gas from the crude oil. From the gas trap the rich gas is compressed, cooled and enters the absorption tower where it is brought in contact with lean absorption oil which dissolves the gasoline vapors carried by the gas. This absorption oil (rich oil) carrying the dissolved gasoline, is heated and pumped into a stripping column which causes the dissolved gasoline vapors to distill away and be condensed as wild natural gasoline containing propane and butane, together with small amounts of methane and ethane. This wild gasoline is then pumped to the stabilization plant, where it is processed under a higher pressure and temperature than in the absorption plant so that the propane and butane will boil away to the upper part of the stabilization column where it is relatively cooler and they can be recovered as almost pure liquid butane and propane. This is known as single column rectification.

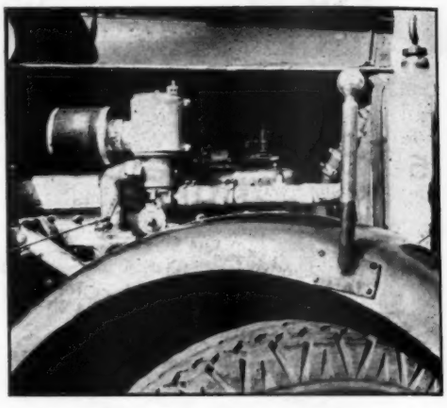
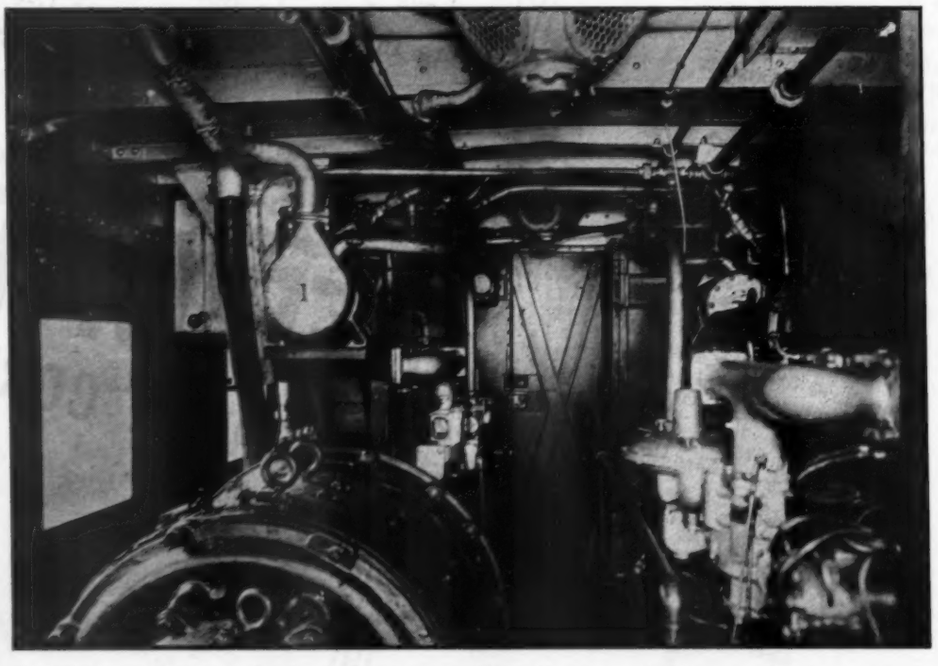


Photo No. 2—Los Angeles R.R. bus-Barton Brown conversion



Interior of Southern Pacific railroad car after being converted to use of butane gas

There are several different designs of fractionating plants using from one to three columns to handle specific wild gases, but the general principle is practically the same. Where

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double column rectification with the finished gasoline from the secondary column is used, the control is simple and it allows the propane, isobutane and normal butane to be separated to a much higher degree of purity.

Figure 2 shows a flow diagram of a three-column by-product fractionating plant. This particular plant was designed to process a gas of the following components:

Components—	Kilograms	Mol. %
Air	263	4.7
Carbon dioxide	41	0.5
Methane	705	10.4
Ethane	1,420	11.1
Propane	3,220	17.3
Iso-butane	3,810	15.7
Normal butane	8,650	35.4
Pentanes	1,790	4.9
	20,265	100.0

This gas will be fed into Column No. 1 as shown in Figure 2, after passing through the cooler from the compressor. The liquid and vapor will flow together in the column. The propane and lighter products will be discharged from the reflux accumulator of the No. 1 column. No. 1 column operates with a pressure of 360 pounds gauge on the vapor side, No. 2 column at 250 pounds and No. 3 column at 150 pounds per square inch gauge pressure. This plant will give very close fractionation and the finished products will be about as follows:

Quantities—	Components
1,186 gallons	50% propane–50% iso-butane
1,780 gallons	Iso-butane and normal butane
324 gallons	Pentanes

The above quantities will be for each 24 hours' run. Figure 2 shows a schematic flow sheet of the above fractionating plant.

Available Supply on Pacific Coast

The question of supply is one hard to answer as so far there is no accurate record kept. However, from the writer's observation there appears to be approximately 2,000,000 gallons available monthly. This amount, however, could be very materially increased if and when the demand was shown.

Some of the uses of liquefied petroleum gases are: (1) For cooking, water heating and refrigeration in homes, camps and small cities or communities not served by natural gas or manufactured gas mains; (2) for motor fuel; (3) for industrial plants such as glass making, steel treating, bakeries, potteries, coffee roasting, etc.; (4) refining lubricating oil; (5) orchard heating.

We have listed the uses in their relative importance in the market on the Pacific Coast. The most important use at present on the Pacific Coast is the use for domestic cooking, heating, water heaters and refrigeration.

Photo No. 3—Plymouth locomotive, metropolitan water district, Los Angeles

Probably the bottled gas, together with the individual gas storage plant, the plants serving groups of isolated cottages, camps and small towns, use the greatest volume of liquefied petroleum gas here on the Pacific Coast. The bottled gas is handled by a few of the large oil companies and a large number of independent dealers who have their containers filled by the large producer, or in some instances have their own plants.

The individual storage tanks are filled by truck, by the dealer, or in some instances, where the consumption is great enough, they have their own truck and pick up their loads at the dealer's plant; however, this handling of the product by the consumer is not encouraged by the manufacturer.

At the rate of increase in the use of butane-propane mixtures as a motor fuel, this market will soon displace the domestic use in the amount of gallonage consumed.

Photograph No. 1 shows a conversion of a caterpillar tractor gasoline engine for the use of a butane-propane mixture as fuel. No. 2 shows one of the Los Angeles Railway Corp. buses equipped with a Barton Brown carburetor and conversion unit for the use of propane-butane mixture as fuel. No. 3 shows a Plymouth locomotive of the Metropolitan Water District equipped for use of liquefied petroleum gas as a fuel.

At the present time the large truck fleet owners, who have converted their equipment to use propane-butane mixtures for fuel, have their own storage tanks situated so that they can service their own trucks. The Southern Pacific Railroad uses this fuel in two of its motor trains and have its storage tanks at the terminals.

There are several manufacturers of conversion units on the Pacific Coast making several types of equipment. One type is a combination whereby either gasoline or butane-propane mix can be used, and is controlled by a valve arrangement on the dash. The other type uses only the butane-propane mixture, the latter being much more efficient.

The cost of converting a truck or tractor varies according to size and ranges from $125 to $175. Where long-term contracts have been made for the fuel supply, it has reduced the cost of operation as much as 50 per cent over the cost of gasoline and also reduced the amount of lubricating oil used considerably, as well as the cost of the engine upkeep.

The next in relative market importance is the industrial use of propane-butane mixtures. A large pottery manufacturer on the Coast is using liquefied petroleum gas in its plant and quite a few glass manufacturers and clay product plants use

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this fuel, as its fine regulation and complete combustion makes it ideal for this work. Wherever steel is to be treated, a mixture of butane and propane for fuel is becoming the common practice. Blacksmith shops, where coal has been used for years, are now using liquefied petroleum gas and finding it very economical. Many contractors' trucks are equipped with tar pot trailers which are heated as they travel by use of a bottle of gas on the truck with a connection to the burner under the trailer tar pot. The manufacturers of tin cans are using butane and propane mixtures as fuel for heating solder, also in their laboratories and in the lithographing departments. Bakeries are using this fuel for heating their ovens as a fine regulation of steady heat can be obtained.

In the refining of lubricating oils a process has been developed whereby the oil is treated with propane which removes all the undesirable heavier components and leaves a much purer and more efficient lubricating oil.

Several orchards in Southern California are equipped with a storage tank and the liquid piped to burners distributed throughout the orchard. This system does away with the smudge, and heats the orchard more economically. One of the features of doing away with the smoke or smudge is that, when the sun comes out, it warms up the orchard much quicker than when the air is full of smoke, allowing a shorter time for the burners to operate. The elimination of the smudge nuisance and the positive protection of the citrus crop is a big boon to Southern California.

Distribution and Maintaining Supply

Most all of the single cottages or small isolated houses are supplied with the bottled gas, that is, in steel containers of from 15 to 20 gallons capacity. These are generally furnished in pairs with a dual control valve, so that when one becomes empty the system can be manually switched to the full tank and another full tank ordered. This assures the consumer a continuous supply, but also ties up a considerable number of idle tanks. In order to cut down the cost of installations, some of the dealers are now supplying only one tank with single control system and renewing or refilling the tank at set intervals. As practically all the bottled gas is sold by the pound, the dealer carries a small portable scale and weighs the amount left in a container or customer's tank, at the time of renewal, so that by deducting this from the weight when full indicates the amount consumed and necessarily the amount to be paid for. This seems to be the ideal system for small home consumption as it is more in line with the meter-reading system on a natural gas installation.

Most of the ranches where butane and propane mixtures are used for fuel for domestic and motor uses have at least a 3,000-gallon storage tank and in most instances a 4,000-gallon tank. The idea of the large storage tank is that where the ranch is some distance from the source of supply a fuel truck with a full load can be taken and dumped before the tank becomes empty. The majority of delivery trucks have a capacity of about 2,500 gallons.

As there is only a difference of approximately $100, present-day price, between a 3,000-gallon tank and a 4,000-gallon tank, and as there is no evaporation loss with this type of fuel, it is economically sound to install the larger capacity.

Photograph No. 4 shows a bulk delivery of the American Liquid Gas Corp. to the Metropolitan Water District camp in the Coachella Valley, all of its camps being operated with this product.

Some of these trucks use the gravity system of delivery into the storage tanks, but most of them are equipped with pumps to increase the speed of delivery. Most all trucks are equipped with vapor-return connections so that an equalization of pressure in the storage tank and truck will allow for faster filling. When the truck is empty of liquid it still contains vapor under pressure and this is calculated into gallons of liquid and subtracted from the total truck outage. There are a few railroad tank cars in operation on the Pacific Coast hauling to city plants and mining properties using large quantities of fuel.

Considerable activity in farm installations has

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been evidenced by several of the companies lately and the butane has been supplied in cylinders containing approximately 300 gallons. These cylinders have been rented or sold directly to the farmer and are delivered individually as he may require them, or they are being filled at regular intervals by a tank truck operating from a central distributing point.

Purchase of Liquefied Petroleum Gas

Where comparison of prices of liquefied petroleum gas with other fuels is made, all calculations should be based on the British thermal units contained in the fuel. For instance, in comparing the cost of heating with electricity, a kilowatt hour is equal to 3,412.4 B.t.u.'s per hour, and 1 gallon of a 30 per cent propane and 70 per cent butane mixture contains 101,643 B.t.u.'s, or almost 29.77 times as much heat value.

Mixtures of propane and butane for fuel should be purchased on specification in order to have the pressure and best heating value necessary in the storage during summer and winter temperatures.

If a minimum pressure is not established in making contracts for fuel supply, there are times when deliveries, to high altitudes and low temperatures, of the regular mix would not give sufficient pressure.

Future of Liquefied Gases on Pacific Coast

Liquefied petroleum products are going to become more and more useful, and with their high octane rating they lend themselves in a most ideal manner to high compression engines, giving much additional horsepower from the same piece of equipment.

Slow burning reduces the high octane stresses in operation. The reduction of oil consumption and elimination of carbon are additional factors.

The inherent possibilities of refrigeration which may be used in operation of trucks, gas plants, and in blending process give tremendous possibilities.

Public utilities, directly or in conjunction with distributors, will continue to develop the gas load beyond their gas lines with bottled propane and butane gas systems, giving thousands of people the convenience of modern gas equipment and building the load for future extension of the gas mains.

Where manufactured gas is of poor quality, butane gas will be used by the larger concerns to obtain a pure, clean gas at reasonable rates, and the manufactured gas companies will use butane as a standby to pick up the peak load, or in many cases manufactured gas plants will be entirely converted to butane.

Many specialty uses for butane will be developed. When blended with other products, startling results are often obtained. Through special heaters in greenhouses, phenomenal growth of the plants have been obtained due to the products of combustion, carbon dioxide and water vapor, which saturate the atmosphere and stimulate very rapid growth of the vegetation.

Small portable systems for fighting forest fires, exterminating and disinfecting purposes, pipe line wrapping and soldering, etc., are already in considerable use, and the next few years will see the development of a great deal of apparatus to utilize propane and butane which will give many new advantages to the American people.

There is one very important use for this fuel which has not been mentioned, but due to the fact that the writer of this article, in conjunction with his company, the American Liquid Gas Corp., are at this time conducting final tests on said use, it is thought best not to announce it at this time.

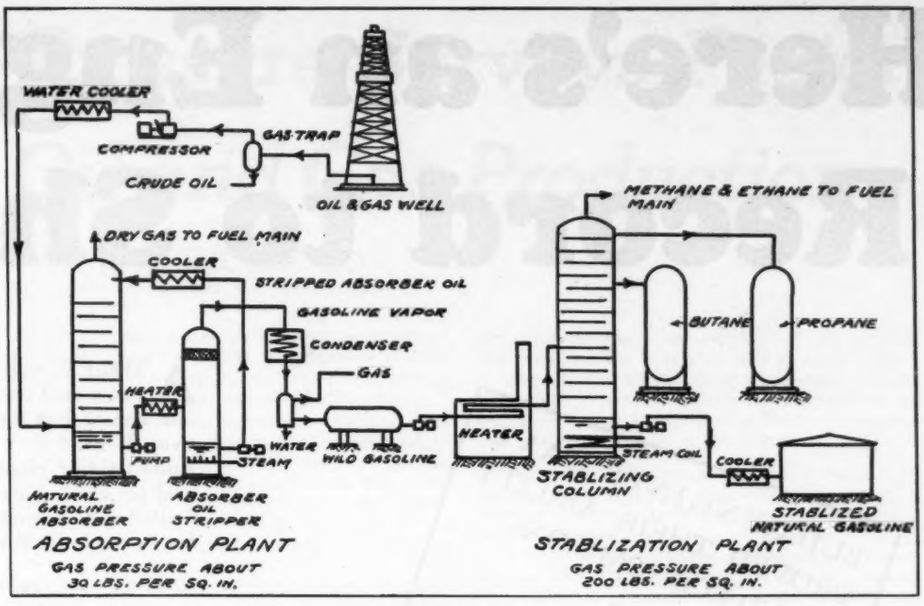


Fig. No. 1

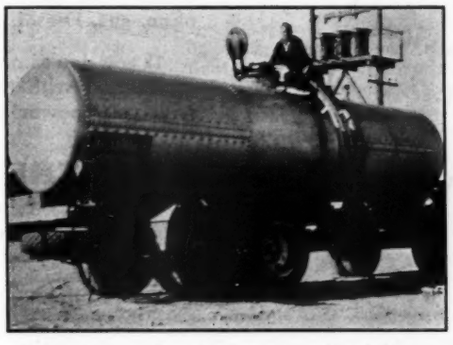


Photo No. 4—Loading butane for delivery

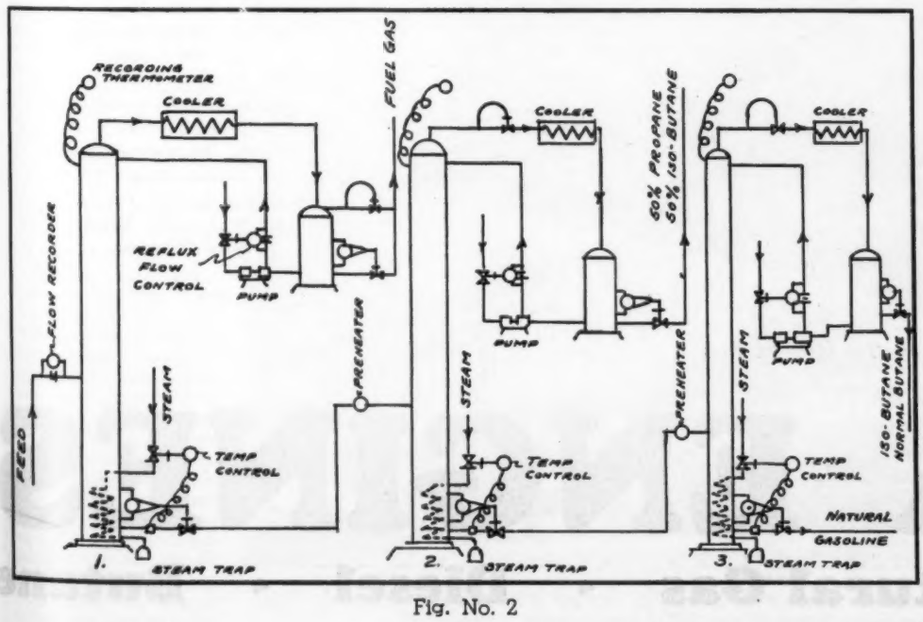


Fig. No. 2

California Tax on Gasoline Is $3,984,626 in September

SACRAMENTO, Calif., Nov. 2.—Doubling the gain shown in August, California gasoline taxes for September reached a total of $3,984,626, marking an advance of $826,943.39, or 26 per cent, over the corresponding figure for September of last year. John C. Corbett, state board of equalization member from San Francisco, made this revelation when motor vehicle fuel tax assessments for September were completed.

The amount of gasoline subject to the 3-cent state tax in September was 134,163,490 gallons, this monthly total being exceeded only twice during the past two years, Mr. Corbett said. He believes that from the showing made in gasoline tax collections thus far during 1935, the annual yield will be well over the $41,000,000 figure previously predicted by the board.

Oil companies reporting the 10 highest sales during September, as listed by Corbett, are stated below. Resale of fuel previously taxed and exemption of sales to the federal Government in interstate and foreign commerce shipments account for differences between total sales and taxable sales, he said.

Company—	Gallons actually sold	Net taxable gallonage
Associated Oil Co.	14,852,922	13,151,676
General Pet. Corp. of California	12,565,931	11,681,614
Gilmore Oil Co., Ltd.	6,093,610	70,088
McDuffie, W. C., receiver, Richfield Oil Co. of California	11,587,579	9,289,759
Rio Grande Oil Co.	4,197,665	4,201,233
Shell Oil Co.	35,105,526	15,676,608
Signal Oil & Gas Co. of California	4,869,462	None
Standard Oil Co. of California	50,000,661	32,206,236
Texas Co.	9,275,657	6,592,196
Union Oil Co. of California	22,952,702	13,514,750

Magnetic Storms

The Tucson, Ariz., observatory of the U. S. Coast and Geodetic Survey reports several magnetic storms.

Telegrams follow:

"Storm began twentieth. Nine. Moderate."
"Storm ended twenty-third. Seven."
"Storm began twenty-fourth. Six. Severe."
"Storm ended twenty-fifth. Nine."
"Storm started twenty-seventh. Four. Moderate."
"Storm ended twenty-eighth. Twenty-two."

Here's an Engine Record to Shoot At!

BUDA ENGINES HAVE PROVED THEIR ABILITY AND ECONOMY ON—

DRILLING
RE-PRESSURING
PUMPING
HOISTING
PIPE LINE PICK-UP
and other Oil Field Services throughout the world!
Capacities from 22 to 180 H.P.

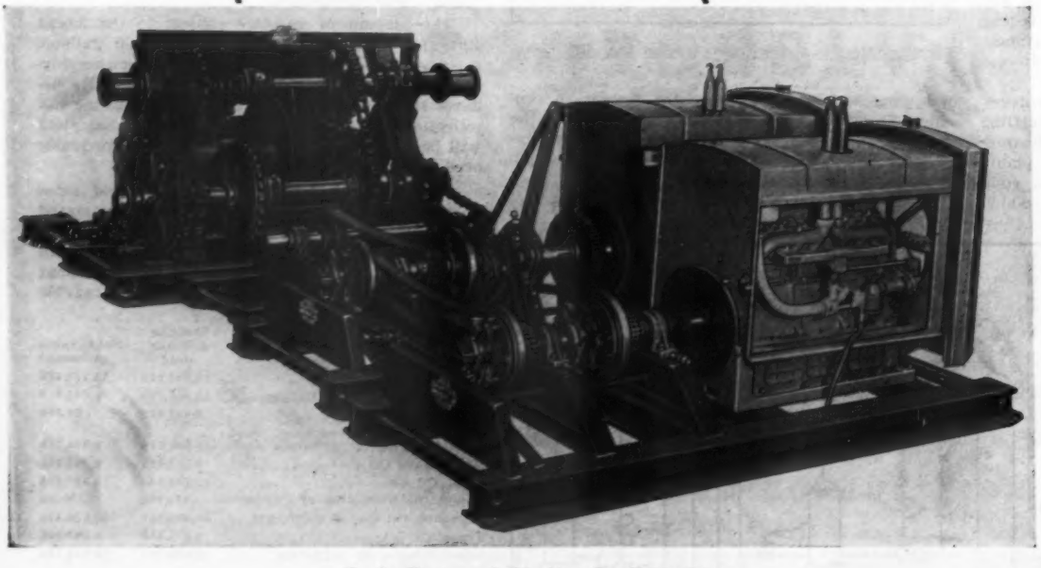
A 3300-FT. well in fifteen days of drilling 24 hours a day at a fuel cost of only $5.22 a day—a fuel cost not for one engine but for three! The power plants were Buda's two JL-4's, 6¼" x 7½", 165 H.P. at 1000 R.P.M., and one Buda lighting plant H-205, 3-13/16 x 4½. The fuel was natural gas at 12 cents per thousand cubic feet, and the well was drilled at Lorraine, Kan. by Mr. Ernie Shaffer, with a Shaffer Portable Drilling Rig.

Here's an engine record to shoot at. Such performance as this is typical of Buda Engines—a fact proved by the many thousands of Buda Engines in oil field service in the hands of leading producers.

Buda Engines are compact. They are easily portable. They require less space and a minimum of foundation alteration. And there is a type to meet every requirement—gasoline, gas, Diesel, Butane.

If you don't know about Buda engines you should become acquainted with their many advantages. Let us help you with your power problem.

THE BUDA COMPANY
Industrial Division M
HARVEY (Chicago Suburb) ILLINOIS



Buda Powered Shaffer Drilling Rig.

AGENTS:

Production Equipment Company,
651 East Gage Avenue,
Los Angeles, California.

The Jno. Muller Company,
3rd & Throckmorton Sts.,
Fort Worth, Texas.

The Jno. Muller Company,
1501 San Jacinto,
Houston, Texas.

The Jno. Muller Company,
Kilgore, Texas.

The Jno. Muller Company,
Odessa, Texas.

Buda Engine Service of Tulsa, Inc.
521 West Archer Street,
Tulsa, Oklahoma.

BUDA ENGINES

Gasoline • Natural Gas • Diesel • Butane

Sub-Surface Pressure Surveys Factor of Value in Oil and Gas Production

By W. H. OSGOOD
Petroleum Engineer, San Marino, Calif.

The part played by pressure in the production of oil and gas is realized by all operators. The well-head pressures, which can be read off the casinghead and tubing-head gauges represent the results of the action taking place in the reservoir and in the well. The pressure at the source—that pressure which causes the oil to move from the reservoir into the well and then up or part way up to the well head, and which is the vital source of energy for oil production, is usually unknown.

The amount of oil that the reservoir supplies to the well and which can be produced varies first, with the prevailing reservoir pressure and secondly, with the permeability, the existence, size and continuity of flow channels. And these conditions apply alike to wells which are flowing, either naturally or on the gas-lift, or pumping.

When a well is on steady production, either pumping or flowing, the reservoir pressure is counterbalanced by the head of fluid plus any surface pressure shown by the well-head gauges, but due to the uncertainty as to the location of the fluid level and the densities of the fluids in the well under variable conditions of pressure, temperature and other factors, the actual reservoir pressure is practically undeterminable at the well-head.

Use of Recorders

The use of subsurface pressure recorders enable these bottom hole and intermediate pressures to be measured directly, providing that the well and tubing are in such mechanical condition that a recorder can safely be lowered to the desired point. In flowing or gas-lift wells, a traverse or run is made once with the well closed in and then at least once, but preferably a number of times, while the well is producing at different rates. A record of the pressure conditions is secured on each run.

In general, these instruments can be put into a well through a lubricator and lowered on a measuring line to any depth physically possible. Stops are made at any desired depths and the pressure indications recorded on contained charts or cards. In pumping wells, the instruments are run in, in a cage attached to the gas anchor, and allowed to remain as long as the time-element of the instrument is capable of recording.

In wells where the instruments are run in on the measuring line, precise depth measurements are possible. Dummy or dead-weight instruments are used where depths alone are desired. Acid bottle and single shot hole inclination equipment have also been run. The subsurface pressure recorder used in conjunction with formation testers would yield valuable information on the initial pressures and temperatures of a newly opened reservoir. Temperature traverses will be possible with certain modifications of some of the available recorders, while some instruments are already capable of that class of work.

At the surface are shown the closed-in pressures which equal the bottom hole pressure minus the weight of the column of oil and gas. For the flowing run (tubing flow) the tubing head pressure is the back pressure on the well; the casinghead pressure is the pressure at the bottom of the tubing which, at this point, is common to both the tubing and casing, plus the weight of the gas and oil column in the casing; if there is no fluid between the tubing and casing, the Dice equation may be used to find the weight of the gas column, and this added to the casinghead pressure will give the pressure at the bottom of the tubing

Fluid Level

The subject of fluid level, the location of the gas-oil contact in a well, requires a brief consideration. It is possible that after a well has been shut down for a long enough period, there may exist a real sharp division of the oil and gas in the column; that is, there may be a column of gas resting on a column of liquid. But it is probable that there is a transition zone consisting of a mixture of the two materials in the form of foam, the extent of which depends primarily upon the interval since the well was producing, and secondarily, upon the existing pressures and temperatures.

The height of the fluid level also enters into the amount of the well-head pressures shown, for, the higher the fluid stands in the static column, the greater will be its counterbalancing effect against the bottom hole pressure and the lower the static column gauge reading. These considerations apply alike to flowing and pumping wells.

The density of water or oil is much greater than that of gas; the difference in pressure between the top and bottom of a 100-foot column of each material may be of the order of:

For gas: Approximately, 1 to 9 pounds per square inch depending upon the composition of the gas, its temperature and the total pressure to which subjected.

For oil: Approximately, 22 to 40 pounds per square inch depending upon its gravity, temperature, amount of gas in solution and other factors.

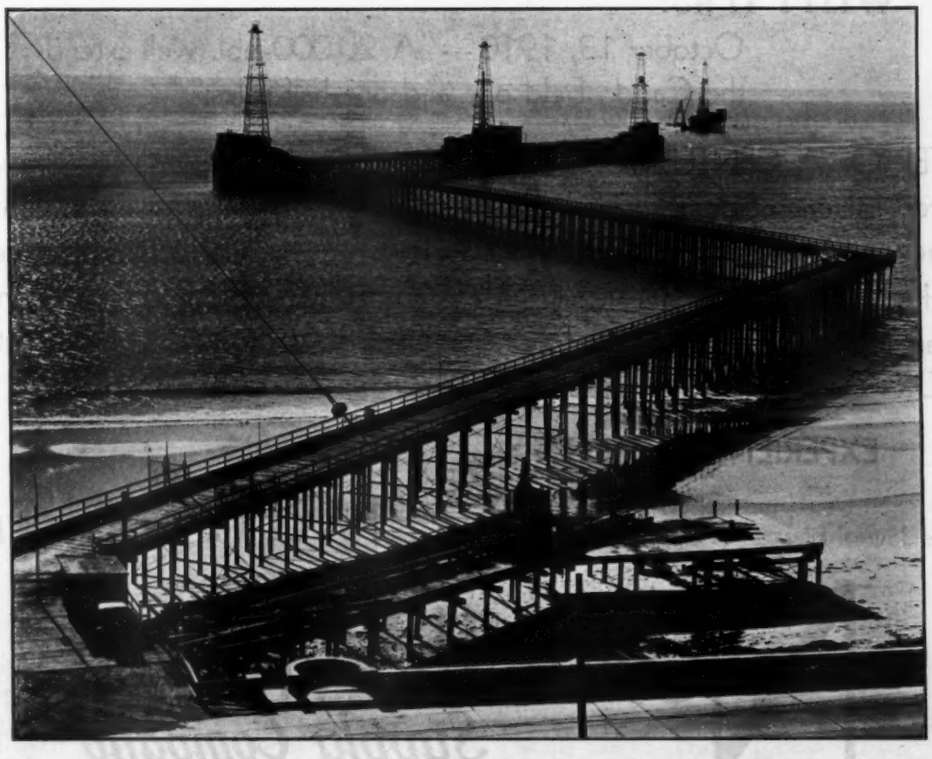
For water: Approximately, 41 to 45 pounds per square inch depending upon its temperature and content of dissolved materials.

Figures intermediate to the above values and even figures within those ranges may indicate mixtures of the different substances present in a well. These differences of pressure per 100 feet or proportional differences per foot, or any other interval desired, are called the gradients which are indicative of the substances present. It is well to mention here that the pressure differential as shown by the gradients in a flowing well is in reality made up of at least two components, namely, the gravitational weight of the quantity of the material between any two depths in the flow column and the loss of pressure due to friction of flow.

By subtracting the pressure existing at the top of the flowing column from the pressure existing at any lower depth, for instance, the bottom of the tubing, the net loss of pressure, due to whatever the causes may be, is obtained.

In pumping wells, the pressure data secured by the recorder are changed into terms of fluid head. These are found for different rates of production and also for the well while off production. The relations between these pressures or heads serve as a basis for the determination of the capacity of the reservoir to supply fluid to the well, and of the well's equipment to bring that fuid to the surface. If the well can be pumped off and the pumping stopped, the recorder will give the "fill-up" curve, or the relation between the gradually increasing head of oil and the gradually decreasing rate of inflow from the reservoir.

As stated previously, the ability of the reservoir to supply oil to any well depends, first, upon the reservoir pressure which is taken as the mean or mid-perforation pressure and by some operators as the bottom hole pressure, after the well has been closed in long enough to allow these pressures to approximate the value of the reservoir pressure. Opinions differ as to the necessary duration of this closed-in interval, probably because



View of General Petroleum's zig-zag 1,700-foot steel approach pier and location of Indian Petroleum's steel island 1,700 feet beyond outer end of pier

NEWS ITEMS TWENTY-FIVE YEARS AGO

foretold the coming of an oil empire of such incalculable value as to make older fields appear infinitely small by comparison.

COMPARE THIS:

October 13, 1910---"A two-thirds interest in a 65 acre lease in the Bolivar field, New York, containing twelve 1-bbl. wells sells for $6,000." *

WITH THIS:

October 13, 1910---"A 20,000-bbl. well extends the Caddo Field one and one-half miles."*

During this QUARTER OF A CENTURY over one thousand five hundred millions of dollars have been taken from this vast new oil empire of the Gulf Coast. To grow up with this unparalled oil development in the Gulf Coast area has been the cherished experience of the NORVELL-WILDER organization.

With Texas alone drilling more wells last year than all the other states of the Union put together and with vast known fields yet to be developed in the Gulf Southwest, is it any wonder that we look forward to the next quarter century with awesome reverence.

EXPERIENCE COUNTS:

Always call the

NORVELL-WILDER MAN --- first.

*From The Oil and Gas Journal Files

Norvell-Wilder Supply Company

the controlling conditions differ between wells. A fill-up curve will indicate actual conditions for any particular well. The second factor, called the productivity index, which is taken as a measure of the reservoir's permeability, is the number of barrels of oil produced per pound pressure drop. In other words, if a well is producing at the rate of 1,000 bbls. per day and the mid-perforation drop in pressure for this rate is (2,220 — 1,430) 790 pounds per square inch, the productivity index is 1,000/790 = 1.26, or 1.26 bbls. of oil will be produced for each pound drop in pressure at the mid-point of the perforations. Now to make a quick estimate of the well's potential or total capacity to produce; with a total mid-perforation point pressure—the reservoir pressure—of 2,220 pounds per square inch available, the well should theoretically be able to produce (2,220/1.26) 1,750 bbls. per day.

More Accurate Figures

Much more accurate figures showing the well's capacity to produce can be arrived at by basing these calculations on the formation volume withdrawn and not on the basis of oil production alone as was done above. It may be stated here that any and all problems of this nature should logically be based on the formation volume withdrawal basis for the one good reason that the reservoir's energy goes into the production of whatever the reservoir supplies—gas, oil and water—and not for the production of oil alone.

The determination of a well's probable capacity to produce oil—and gas—is as much needed for appraisal purposes as for operating purposes. And it is certainly more simple and less costly to use the subsurface pressure data of a well as a basis for the mechanical installation in the well, than the trial and error method with its consequent expense.

As stated by Bruce Robinson in a paper presented before the Long Beach chapter of the A.P.I., the values of the productivity index—based on oil alone—vary from 0.1 to 10.0, and some higher values would range considerably higher when based on the formation yield, rather than on net oil produced.

Application of Survey

A few notes may not be out of place relative to the possible application of the pressure survey. As stated by one authority, notable progress has been made in the technique of well drilling and of fitting the wells for production control at the well head, but very little has been accomplished towards the study of the control of the production and of the energy, which is the fundamental factor entering into oil production, at the source or rather at the point nearest to the source at which it is possible to get, namely, the producing horizon open to the well bore. Having the pressure-volume-temperature relationships which are the factors entering into energy at the well head and with the pressure and temperatures now measurable apposite the producing formation, the bottom hole and reservoir volume conditions can be calculated with the aid of the results of the work of Lacey and others engaged in similar researches.

As seems to be logically assumed, drainage must occur from areas of high pressure towards low pressure areas. One question to be settled in this connection is whether that pressure should be taken at some common datum referred to sea level or at some common stratigraphic datum. By plotting the values of the bottom hole pressure or the datum values on a map, pressure contours can be drawn and the field's pressure distribution made apparent. The best example of this type of study has been the pressure maps of the East Texas Field published from time to time in the technical press.

When cumulative production is plotted against the successive values of the bottom hole pressure, the amount of production per unit drop of pressure is indicated. This curve is practically a straight line when cumulative formation volume withdrawal is used but is usually curved when based on net oil production. But more important is the possibility of predicating the ultimate production of the field, lease or well by extrapolating the curve to some economic limit of production. This applies strictly to fields where the energy for production is derived from the high pressure gas. In water-drive fields, this pressure will show very little, if any, decline, when the reservoir content is being taken out at a rate low enough to allow the encroaching water to enter as the fluid is produced. If production is too fast, the pressure will drop. Energy from both sources, gas and water drive, enters into the actual production of most fields and, therefore, the pressure-cumulative production curve will show the characteristics of both sources of energy, the gas drive initially, followed by the water drive.

Depth-Pressure Curves

Returning to the type depth-pressure curves, it can be seen how the bottom hole flowing pressure decreases as the surface back pressure is decreased. One problem is to determine when a well will stop flowing, or when a gas-lift well will have to change to pumping. The graphical answer is that when the depth-pressure curve has moved bodily to the left, to the position where its upper end intersects the ordinate or depth axis at the well-head elevation—i.e., at zero back pressure. The form of this curve depends upon the reservoir conditions and the flowing conditions as imposed by the mechanical equipment of the well, and the only immediate control that can be exercised is that of the surface back pressure.

Even when the beans have been fully opened, there is still a considerable back pressure on the formation due to the weight of the flowing column and the frictional effects of the flow. The effects of these two factors work opposite to each other in this way: the greater the production the greater will be the amount or proportion of gas in the

CALIFORNIA'S PETROLEUM PRODUCTION
From the Beginning of the Industry to October 1, 1935, by Fields

Year—	Elwood	Santa Barbara	Rincon	San Miguelito	Ventura Avenue	Ventura-Newhall	Los Angeles, Salt Lake	Whittier	Fullerton	Coyote	Santa Fe Springs	Montebello	Richfield	Huntington Beach	Long Beach
Prior	.....	.....	.....	.....	.....	175,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
1876	.....	.....	.....	.....	.....	12,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
1877	.....	.....	.....	.....	.....	13,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
1878	.....	.....	.....	.....	.....	15,227	.....	.....	.....	.....	.....	.....	.....	.....	.....
1879	.....	.....	.....	.....	.....	19,858	.....	.....	.....	.....	.....	.....	.....	.....	.....
1880	.....	.....	.....	.....	.....	40,552	.....	.....	.....	.....	.....	.....	.....	.....	.....
1881	.....	.....	.....	.....	.....	99,862	.....	.....	.....	.....	.....	.....	.....	.....	.....
1882	.....	.....	.....	.....	.....	128,636	.....	.....	.....	.....	.....	.....	.....	.....	.....
1883	.....	.....	.....	.....	.....	142,857	.....	.....	.....	.....	.....	.....	.....	.....	.....
1884	.....	.....	.....	.....	.....	262,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
1885	.....	.....	.....	.....	.....	325,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
1886	.....	.....	.....	.....	.....	377,145	.....	.....	.....	.....	.....	.....	.....	.....	.....
1887	.....	.....	.....	.....	.....	678,572	.....	.....	.....	.....	.....	.....	.....	.....	.....
1888	.....	.....	.....	.....	.....	690,333	.....	.....	.....	.....	.....	.....	.....	.....	.....
1889	.....	.....	.....	.....	.....	303,220	.....	.....	.....	.....	.....	.....	.....	.....	.....
1890	.....	.....	.....	.....	.....	307,360	.....	.....	.....	.....	.....	.....	.....	.....	.....
1891	.....	.....	.....	.....	.....	323,600	.....	.....	.....	.....	.....	.....	.....	.....	.....
1892	.....	.....	.....	.....	.....	385,049	.....	.....	.....	.....	.....	.....	.....	.....	.....
1893	.....	.....	.....	.....	.....	470,179	.....	.....	.....	.....	.....	.....	.....	.....	.....
1894	.....	.....	.....	.....	.....	570,469	196,094	.....	.....	.....	.....	.....	.....	.....	.....
1895	.....	.....	.....	.....	.....	474,624	749,695	.....	.....	.....	.....	.....	.....	.....	.....
1896	.....	.....	.....	.....	.....	298,866	902,868	.....	.....	.....	.....	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	631,135	1,064,158	.....	12,000	.....	.....	.....	.....	.....	.....
1898	.....	.....	.....	.....	.....	763,871	1,126,000	.....	60,000	.....	.....	.....	.....	.....	.....
1899	.....	.....	.....	.....	.....	743,998	1,052,036	.....	217,599	.....	.....	.....	.....	.....	.....
1900	.....	.....	.....	.....	.....	628,734	1,280,000	.....	511,550	.....	.....	.....	.....	.....	.....
1901	.....	.....	.....	.....	.....	495,943	1,830,000	.....	753,198	.....	.....	.....	.....	.....	.....
1902	.....	.....	.....	.....	.....	646,496	2,027,000	.....	1,103,793	.....	.....	.....	.....	.....	.....
1903	.....	.....	.....	.....	.....	682,185	793,765	.....	2,305,613	.....	.....	.....	.....	.....	.....
1904	.....	.....	.....	.....	.....	650,779	1,241,304	.....	2,224,550	.....	.....	.....	.....	.....	.....
1905	.....	.....	.....	.....	.....	476,898	2,226,768	.....	2,118,312	.....	.....	.....	.....	.....	.....
1906	.....	.....	.....	.....	.....	404,379	2,675,650	.....	2,434,512	.....	.....	.....	.....	.....	.....
1907	.....	.....	.....	.....	.....	435,584	3,372,465	.....	3,294,206	.....	.....	.....	.....	.....	.....
1908	.....	.....	.....	.....	.....	498,015	5,138,959	.....	4,273,314	.....	.....	.....	.....	.....	.....
1909	.....	.....	.....	.....	.....	516,628	4,350,898	.....	5,157,252	.....	.....	.....	.....	.....	.....
1910	.....	.....	.....	.....	.....	652,575	3,729,618	.....	6,281,221	.....	.....	.....	.....	.....	.....
1911	.....	.....	.....	.....	.....	661,735	3,223,661	.....	7,081,165	.....	.....	.....	.....	.....	.....
1912	.....	.....	.....	.....	.....	859,385	3,073,427	747,439	5,813,037	1,359,303	.....	.....	.....	.....	.....
1913	.....	.....	.....	.....	.....	1,022,052	2,898,846	690,133	6,189,561	2,777,359	.....	.....	.....	.....	.....
1914	.....	.....	.....	.....	.....	968,421	2,504,475	636,789	6,495,100	6,998,659	.....	.....	.....	.....	.....
1915	.....	.....	.....	.....	.....	1,028,106	2,694,194	758,163	5,505,999	6,610,508	.....	.....	.....	.....	.....
1916	.....	.....	.....	.....	2,650	1,083,635	1,729,761	1,014,667	4,806,104	5,588,699	.....	.....	.....	.....	.....
1917	.....	.....	.....	.....	7,100	1,129,817	1,453,161	1,156,752	4,527,875	11,458,471	.....	789,635	.....	.....	.....
1918	.....	.....	.....	.....	23,609	1,373,213	1,347,471	1,046,467	4,361,751	12,614,598	.....	6,839,267	.....	.....	.....
1919	.....	.....	.....	.....	38,435	1,734,762	1,328,021	1,001,048	4,349,376	10,240,359	.....	12,100,784	965,408	.....	.....
1920	.....	.....	.....	.....	105,185	1,944,630	1,320,573	842,184	5,237,044	8,732,435	.....	11,124,585	2,565,346	38,116	.....
1921	.....	.....	.....	.....	127,674	1,976,473	1,314,213	735,376	5,962,008	7,419,050	208,216	9,065,723	8,206,962	2,518,812	75,588
1922	.....	.....	.....	.....	685,347	2,330,630	1,258,287	717,729	4,512,974	7,000,373	11,032,955	6,692,024	8,314,528	11,169,382	18,560,595
1923	.....	.....	.....	.....	1,423,187	2,279,217	1,192,036	645,219	4,064,661	2,447,825	79,781,275	4,075,869	6,121,335	34,355,642	68,810,361
1924	.....	.....	.....	.....	1,831,903	2,188,266	907,463	761,211	4,120,789	5,683,559	26,399,655	6,230,299	4,467,679	17,523,520	60,122,902
1925	.....	.....	.....	.....	6,999,403	2,264,069	731,912	742,676	4,481,443	7,140,004	18,969,528	6,843,194	4,318,488	15,887,474	40,172,375
1926	.....	.....	.....	.....	14,795,495	2,204,381	675,960	742,125	6,987,489	6,030,619	17,446,709	6,515,493	5,574,244	19,064,814	37,931,964
1927	.....	.....	.....	5,923	17,808,704	2,197,644	630,660	660,505	7,008,934	5,146,864	15,153,578	5,498,252	7,854,042	26,344,697	34,541,667
1928	849,886	.....	1,082,735	.....	18,920,942	2,096,343	560,607	612,126	5,743,044	4,901,998	16,093,931	4,369,638	6,798,673	19,642,278	62,467,103
1929	9,431,774	10,868	1,192,237	.....	20,934,388	1,856,706	552,614	563,790	4,813,942	4,176,035	76,477,464	3,657,922	5,776,258	16,007,030	60,495,555
1930	14,606,007	12,851	1,003,204	.....	17,493,155	1,772,131	545,959	516,802	4,423,266	3,890,047	44,261,396	2,712,725	3,642,578	11,108,203	36,699,889
1931	10,470,056	110,880	710,178	24,249	15,255,356	1,225,525	464,564	474,261	3,626,008	3,751,857	24,272,660	2,446,052	2,432,186	7,778,549	30,166,409
1932	6,441,626	156,446	628,179	252,247	12,332,853	1,259,755	394,124	399,540	3,018,125	3,716,467	22,538,036	2,162,530	2,263,699	8,016,091	27,435,552
1933	4,918,488	249,426	680,471	390,559	12,576,208	1,199,997	313,810	404,128	2,964,674	3,698,372	18,371,807	1,933,121	2,467,913	13,091,926	24,798,242
1934	4,113,644	598,165	540,886	268,643	9,882,614	1,400,039	289,154	393,476	3,744,538	4,144,036	14,722,264	1,980,942	2,925,001	15,106,268	23,067,035
1935*	3,147,647	938,580	479,866	195,472	7,487,356	1,080,090	218,199	280,624	2,698,417	3,351,994	11,146,431	1,644,572	2,110,489	11,173,950	19,302,914
Total*	52,979,128	2,077,216	6,323,679	1,131,170	158,731,364	53,577,301	64,775,350	16,547,230	153,284,444	142,879,491	396,765,905	96,682,427	76,826,829	228,836,662	544,549,041

*Includes production up to October 1, 1935.

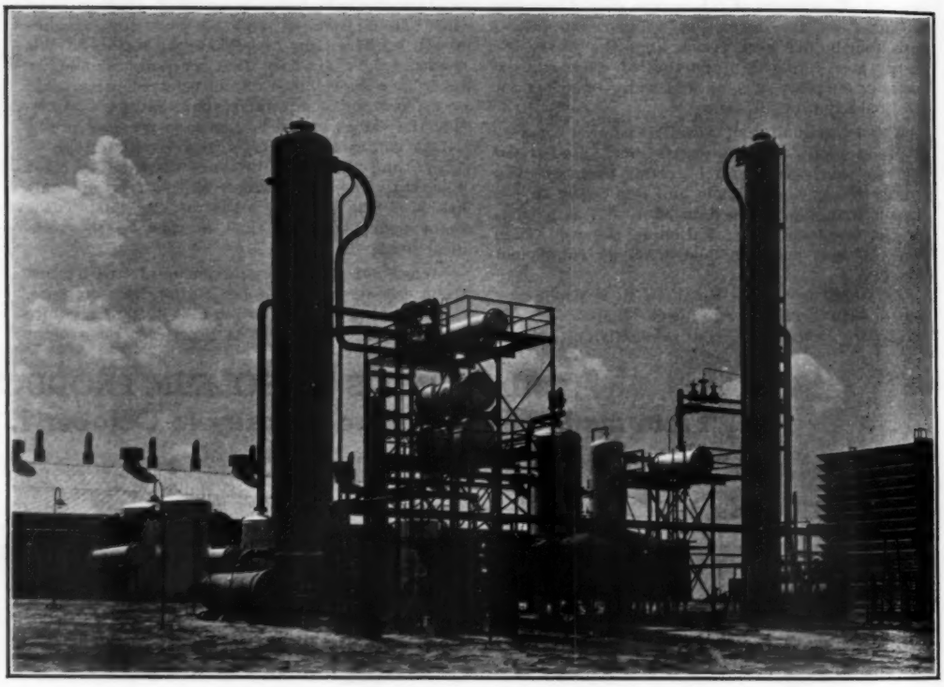
(Table continued on Page 139)

Engineering BASED on ECONOMICS

6 YEARS CONTINUOUS SERVICE

A Partial List of Our Clients

Altitude Petroleum Corp.
Anderson-Prichard Oil Corp.
Argentine Government
Barnsdall Oil Company
Chalmette Petr. Corp.
Cushing Ref. & Gas Co.
Elverath Refinery
Empire Companies
Gregg-Tex Gasoline Corp.
Gypsy Oil Company
Hanlon-Buchanan, Inc.
Hanlon Gasoline Co.
Henderson Company
Kanotex Refining Co.
Lisbon Gasoline Co.
Louisville Gas & Elec. Co.
Magnolia Petroleum Co.
Maltha Refinery
Mid-Continent Petr. Corp.
Midland Gasoline Co.
Peppers Gasoline Co.
Pure Oil Company
Rock Island Refining Co.
Sabine Valley Gasoline Co.
Shamrock Oil & Gas Co.
Skelly Oil Company
Standard of Indiana
Sunray Oil Company
Taxman Refining Co.
Texas Company
Texas Pacific Coal & Oil Co.
United Gas Corp.
White Eagle Refining Co.



Vapor Rectification Type Gasoline Plant, Patent No. 1,977,087.

VAPOR RECOVERY PLANTS
GASOLINE PLANTS *SOLVENT PLANTS*
STABILIZERS *RECTIFIERS*

Consultation

PETROLEUM *Engineering, Inc.*
Associated with Arthur G. McKee & Company

PHILTOWER BUILDING . . . . TULSA, OKLAHOMA

2422 Euclid Avenue
CLEVELAND, OHIO

Bush House, Aldwych, W.C. 2
LONDON, ENGLAND

flowing mixture and the lighter will be the weight of the flowing column. This will cause the curve to become steeper or at a greater inclination to the horizontal axis. But the resulting greater velocity of flow will cause greater friction losses and therefore greater pressure drops. This tends to cause the curve to lie at a lower inclination. And each of those factors must be considered in relation as to whether the fluid flowing is a liquid or, which is usually the case, one of the infinite number of proportional mixtures of the two phases, plus some water thrown in to complicate matters. This would be a hard problem to work out on paper but by means of the pressure traverses the curves can be plotted for different rates of flow and, when taken at two or preferably three successive intervals of time, the solution of the problem is indicated.

Flow-String Design

Another important problem which will be solvable when required is the question of the design of the flow string—that is, the securing of the minimum pressure drop commensurate with the limitation imposed by the well size and the cost in dollars. But as long as we apply the back pressure through beaning at the surface, there is no need for special or efficient flow column design in order to conserve the energy to be merely dissipated at the surface. As soon as the available energy is utilized at the bottom of the flow string and made to lift the oil, then the proper design of flow string will be a question of real economy and the pressure drop through the flow string as shown by the pressure recorder will be of real importance in this connection.

CALIFORNIA PRODUCTION BY FIELDS (Continued from Page 137)

Year—	Edison	Mountain View	Kern River	Mount Poso	Fruitvale	Round Mountain	McKittrick	Midway-Sunset	Elk Hills	Lost Hills-Belridge	Coalinga	Kettleman Mid. Dome	Kettleman No. Dome	Wheeler Ridge	Santa Maria
1896	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,119	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70,140	.....	.....	.....	.....
1898	.....	.....	.....	.....	.....	.....	10,000	.....	.....	.....	154,000	.....	.....	.....	.....
1899	.....	.....	.....	.....	.....	.....	15,000	.....	.....	.....	429,372	.....	.....	.....	.....
1900	.....	.....	826,775	.....	.....	.....	80,000	12,500	.....	.....	547,960	.....	.....	.....	.....
1901	.....	.....	3,278,840	.....	.....	.....	430,450	192,835	.....	.....	525,432	.....	.....	.....	.....
1902	.....	.....	8,988,046	.....	.....	.....	619,296	170,606	.....	.....	571,233	.....	.....	.....	94,188
1903	.....	.....	16,342,099	.....	.....	.....	1,353,206	379,870	.....	.....	2,138,058	.....	.....	.....	204,890
1904	.....	.....	17,226,240	.....	.....	.....	1,856,225	391,385	.....	.....	5,097,853	.....	.....	.....	700,450
1905	.....	.....	15,253,845	.....	.....	.....	1,373,030	437,742	.....	.....	8,882,125	.....	.....	.....	3,402,800
1906	.....	.....	12,825,166	.....	.....	.....	680,756	319,350	.....	.....	8,401,105	.....	.....	.....	4,799,411
1907	.....	.....	12,346,014	.....	.....	.....	2,415,840	854,749	.....	.....	8,996,268	.....	.....	.....	8,249,236
1908	.....	.....	13,803,579	.....	.....	.....	3,076,300	1,898,088	.....	.....	10,726,795	.....	.....	.....	8,699,350
1909	.....	.....	14,508,242	.....	.....	.....	5,807,360	4,234,156	.....	.....	15,406,619	.....	.....	.....	8,017,455
1910	.....	.....	14,776,436	.....	.....	.....	5,471,613	20,392,111	.....	4,900	18,646,570	.....	.....	.....	7,607,830
1911	.....	.....	14,078,890	.....	.....	.....	5,477,532	27,143,671	.....	165,410	18,311,251	.....	.....	.....	7,465,074
1912	.....	.....	12,446,445	.....	.....	.....	5,094,465	31,539,804	.....	2,680,961	19,546,122	.....	.....	.....	6,801,966
1913	.....	.....	9,980,940	.....	.....	.....	4,496,842	39,024,780	.....	5,274,553	18,604,626	.....	.....	.....	5,817,711
1914	.....	.....	7,030,545	.....	.....	.....	3,820,857	50,025,843	.....	4,820,921	15,925,887	.....	.....	.....	4,383,080
1915	.....	.....	5,094,673	.....	.....	.....	3,585,899	39,621,003	.....	4,310,476	13,567,380	.....	.....	.....	4,466,200
1916	.....	.....	5,539,973	.....	.....	.....	3,347,166	39,172,871	.....	4,873,501	14,393,437	.....	.....	.....	4,342,605
1917	.....	.....	5,593,034	.....	.....	.....	3,275,529	37,094,435	.....	6,359,421	15,898,912	.....	.....	.....	5,956,057
1918	.....	.....	5,060,255	.....	.....	.....	3,060,572	34,831,580	.....	5,462,857	16,360,225	.....	.....	.....	7,180,174
1919	.....	.....	7,630,937	.....	.....	.....	2,837,324	32,198,593	281,019	4,661,011	16,408,829	.....	.....	.....	6,055,448
1920	.....	.....	7,457,810	.....	.....	.....	2,600,763	30,656,596	7,275,809	4,168,559	15,697,035	.....	.....	.....	5,782,426
1921	.....	.....	6,706,420	.....	.....	.....	2,070,369	28,773,388	18,085,425	3,360,931	12,522,157	.....	.....	.....	5,465,262
1922	.....	.....	7,317,288	.....	.....	.....	2,417,434	29,694,842	11,891,030	2,814,824	9,159,368	.....	.....	.....	3,797,903
1923	.....	.....	6,816,134	.....	.....	.....	3,191,702	27,803,281	8,174,371	1,842,483	5,210,539	.....	.....	128,674	3,003,672
1924	.....	.....	6,773,321	.....	.....	.....	2,094,598	27,464,589	13,589,611	1,526,371	10,144,428	.....	.....	342,367	2,857,495
1925	.....	.....	5,901,877	.....	.....	.....	2,091,971	26,923,402	11,971,149	1,730,140	7,751,107	.....	.....	344,760	2,596,581
1926	.....	.....	4,312,171	46,226	.....	.....	1,961,028	23,968,755	13,292,754	1,693,666	7,295,807	.....	.....	371,931	1,852,356
1927	.....	.....	6,098,582	40,277	.....	3,700	1,855,603	31,670,708	10,073,073	1,515,300	7,154,599	.....	.....	374,734	1,999,051
1928	.....	.....	5,071,284	53,977	133,433	44,455	1,805,485	27,314,093	8,107,198	1,526,491	4,655,284	.....	199,699	329,485	2,041,497
1929	.....	.....	6,089,344	1,826,056	594,498	223,734	1,708,520	25,310,976	6,353,635	1,602,425	3,558,843	.....	1,951,786	250,156	1,536,315
1930	.....	.....	5,349,915	3,883,924	903,337	1,194,332	1,489,628	23,487,147	6,572,379	1,313,475	3,373,078	.....	6,209,357	219,237	1,152,593
1931	.....	.....	3,857,474	3,009,374	867,719	245,426	903,732	18,728,461	4,926,636	2,983,749	2,978,392	.....	17,544,824	192,897	1,015,205
1932	.....	.....	3,387,262	2,907,839	1,600,801	928,814	651,792	17,929,036	4,537,461	3,329,984	3,649,573	10,537	21,949,072	187,299	1,080,723
1933	.....	233,841	3,210,010	3,050,826	1,672,805	1,118,913	651,361	17,541,812	4,487,978	3,205,873	4,423,513	151,979	21,472,041	168,918	1,264,818
1934	135,792	2,609,017	3,704,447	3,456,217	1,842,734	1,808,232	1,105,618	19,712,566	3,345,772	4,391,089	6,594,950	127,998	21,265,884	156,204	1,806,106
1935*	526,382	5,792,597	3,186,896	3,790,242	1,244,687	1,575,102	1,009,495	14,734,495	2,320,311	3,783,878	5,333,030	31,298	17,881,180	115,817	1,158,117
Total*	661,174	8,634,955	299,864,209	22,094,957	8,360,004	7,148,298	84,794,351	781,651,369	134,284,011	79,307,249	339,135,326	321,812	108,473,843	3,182,519	132,563,847

*Includes production up to October 1, 1935.

Prior	Capitan	Summerland	Goleta	Torrance	Dominguez	Rosecrans	Inglewood	Newport	Seal Beach	Potrero	Lawndale	Playa Del Rey	Watsonville Miscellaneous	Total
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	175,000
1876	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,000
1877	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,000
1878	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,227
1879	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,858
1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40,552
1881	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99,862
1882	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	128,636
1883	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	142,857
1884	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	262,000
1885	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	325,000
1886	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	377,145
1887	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	678,572
1888	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	690,333
1889	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	303,220
1890	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	307,360
1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	323,680
1892	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	285,049
1893	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	470,179
1894	.....	1,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,715	783,079
1895	.....	16,904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,116	1,245,339
1896	.....	39,792	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,135	1,257,780
1897	.....	130,136	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,000	1,911,569
1898	.....	132,217	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,000	2,249,088
1899	.....	208,370	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500	2,677,875
1900	.....	183,486	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	248,945	4,319,950
1901	.....	203,616	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,710,315
1902	.....	136,252	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,356,910
1903	.....	131,125	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,670	24,334,481
1904	.....	120,506	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	39,392	29,548,634
1905	.....	96,871	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29,650	34,298,041
1906	.....	72,810	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,090	32,623,229
1907	.....	69,060	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	69,090	40,102,512
1908	.....	67,862	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	125,475	48,306,737
1909	.....	66,338	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	126,775	58,191,722
1910	.....	74,725	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	58,970	77,697,568
1911	.....	71,255	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	61,350	83,744,044
1912	.....	65,715	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45,870	90,074,439
1913	.....	62,406	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	97,867,184
1914	.....	55,743	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	103,623,695
1915	.....	55,800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	89,725,776
1916	.....	53,500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,450	91,976,019
1917	.....	54,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	97,781,574
1918	.....	54,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	102,643,415
1919	.....	54,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,375	101,907,729
1920	.....	54,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25,610	105,618,706
1921	.....	54,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25,854	114,566,901
1922	.....	48,339	.....	190,785	.....	.....	.....	.....	.....	.....	.....	.....	20,338	139,626,876
1923	.....	52,362	.....	3,128,694	157,698	.....	.....	.....	.....	.....	.....	.....	21,058	263,728,895
1924	.....	53,201	.....	17,526,123	6,811,531	611,432	10,445	.....	.....	.....	.....	.....	20,979	230,063,117
1925	.....	48,351	.....	18,242,113	13,328,817	7,363,466	18,348,395	32,661	.....	.....	.....	.....	20,986	236,147,342
1926	.....	46,855	.....	10,854,905	7,301,586	6,113,430	17,390,131	32,973	587,107	.....	.....	.....	20,990	224,117,013
1927	.....	49,475	86,840	8,338,938	5,887,645	3,506,116	12,751,556	12,485	16,424,929	571	.....	.....	20,871	230,791,463
1928	.....	44,853	45,266	6,454,067	4,267,009	3,392,325	10,762,797	13,146	12,436,371	107,380	15,686	.....	22,010	231,982,597
1929	2,795	93,526	4,045	5,000,218	3,606,350	2,463,808	8,768,101	15,330	14,418,305	271,446	392,532	25,121	22,762	292,036,911
1930	25,295	118,042	.....	4,116,546	3,694,075	2,435,341	6,429,205	14,600	8,026,796	638,268	130,472	4,719,981	22,764	228,999,899
1931	53,183	59,115	.....	2,191,781	4,183,052	1,344,452	5,289,125	6,897	4,882,115	353,160	121,670	9,759,018	22,795	188,829,032
1932	3,092	39,386	.....	2,281,274	6,823,579	1,125,634	4,869,335	927	4,522,489	252,609	110,350	5,910,926	22,824	178,127,794
1933	24,621	31,434	.....	2,362,719	6,626,605	1,080,247	4,059,973	.....	3,991,901	141,791	79,460	4,059,240	21,999	173,082,319
1934	194,414	20,039	.....	2,525,990	6,655,465	1,037,817	3,376,586	.....	3,515,457	150,084	53,640	3,187,773	21,900	175,508,566
1935*	345,795	11,804	.....	1,875,885	5,622,018	751,644	3,147,876	101	2,502,695	105,255	38,053	4,202,453	16,205	146,359,013
Total*	649,195	3,103,881	136,151	79,590,239	75,465,930	30,126,703	95,262,525	129,120	71,308,165	2,020,564	941,864	31,864,512	1,396,488	4,398,375,598

*Includes production up to October 1, 1935.

Combination of Pipe Line and Tankers Is Used Effectively in California

There is a very definite trend in California towards the use of shorter pipe lines and expansion of marine traffic to move crude oil and natural gasoline to refining centers. The geographical location of producing fields and proximity of refineries to tidewater renders this policy both advantageous and economical. The Union Oil Co. adopted this practice early in its career by terminating the Producers Transportation Co.'s San Joaquin Valley pipe line system at Port San Luis, a seaport in San Luis Obispo County. Practically all of Union's production and purchases of crude oil in the San Joaquin Basin moves out of Port San Luis and at one time this was the State's leading port as far as the movement of crude and fuel oil was concerned. From Port San Luis the company moves its crude oil by tanker to either the Oleum or Wilmington refinery, as occasion demands.

California crude oil pipe lines consist of three well defined systems. These are (1) those pipe lines in Los Angeles Basin which all converge on a common center, San Pedro-Wilmington; (2) those which originate in the San Joaquin Basin and extend northward up through the central valley to terminals in the San Francisco Bay region, and (3) those that originate in the San Joaquin Valley and extend westward to tidewater facilities on the coast. Standard, Associated and Shell have pipe lines that extend northward through the San Joaquin Valley to San Francisco. Union's San Joaquin pipe line system terminates at tidewater on the coast at Port San Luis. Standard and Associated, in addition to having lines extending northward, also have pipe line facilities westward to the coast. Standard's tidewater terminal is at Estero and Associated's at Monterey.

Dual Transportation System

Experience over a number of years has indicated it is more economical to employ a dual system of transportation involving pipe line and tanker haul because in addition to economies effected it greatly enhances flexibility of operation. This is particularly obvious because a pipe line from San Joaquin Valley to tidewater in San Luis Obispo County permits marketers and refiners to move crude or refined oil to either Los Angeles or San Francisco as the tidewater terminal is approximately midway between the two cities. Associated Oil Co., recognizing the advantages of this dual method of operation, reconditioned its Coalinga-Monterey pipe line a few years ago by cutting out the original screw collars and converting the line into a welded unit for its entire distance. This reconditioning program was undertaken simultaneously with the development of substantial production in the Kettleman North Dome and North Belridge Fields. This company subsequently purchased Standard's interest in the Associated Pipe Line Co. and now uses exclusively its San Joaquin Valley pipe line system for movement of crude to its Avon refinery, in the San Francisco Bay region.

It is generally believed a substantial part of California's crude oil reserves are in the San Joaquin Basin. If either General Petroleum, Shell or Texas Co. develop substantial production in a new San Joaquin Valley field, necessitating additional pipe line construction, it is assumed a new line would be laid westward to tidewater instead of being routed over the Tehachapi Mountains into Southern California. This would permit greater flexibility of operation and prove less costly because it would require less pipe and result in lower operating and installation costs. Crossing state highways and tearing up paved streets greatly increases installation costs, especially in Los Angeles Basin, where there are numerous incorporated cities in addition to Los Angeles.

Early in 1935 the Standard Oil Co. completed installation of a new pipe line from Rio Bravo in Kern County to tidewater at Estero in San Luis Obispo County, with a submarine connection. The company is using this line for transportation of light and heavy San Joaquin Valley oil to tidewater. Standard's Valley pipe line system, extending northward from Coalinga to Richmond in the San Francisco Bay region, has practically been relegated to the status of a standby unit, although still in operation. Eventually this entire line may be abandoned, although a part of the northern portion may be retained due to reservoir storage at Pittsburg and steel tankage at Los Mendanos in Contra Costa County.

May Build to Tidewater

General Petroleum Corp., California affiliate of Socony-Vacuum, will eventually construct a pipe line from San Joaquin Valley to tidewater, if developments warrant, as the company a few years ago purchased several hundred acres near Cayucos adjacent to tidewater for use as a tank farm site and western terminal of a projected pipe line system. General Petroleum's existing main trunk extends from Lost Hills in the San Joaquin Basin to Los Angeles harbor. The company recently completed a new 10-inch welded line from Lebec to its Torrance refinery and this new 89-mile line gives the company a direct route between San Joaquin Valley fields and Torrance. Heretofore, the company was obliged to pump through Los Angeles via its Vernon topping plant due to the location of the company's original 8-inch pipe line.

The transportation of crude oil and refined products by tankers has grown to be a very important factor in the operations of California marketers. Previous to 1920, crude produced in Southern California was for the most part refined in that area, while the output from San Joaquin Valley fields was moved northward by pipe line to the San Francisco Bay region, where Standard, Shell, Associated and Union have refineries. Union, unlike Associated, Standard and Shell,

Pipe line suspended by cables from cliff in Ventura County

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November 1, 1935

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Chas. D. Hagen

Vice President and Manager

does not have a pipe line north of Coalinga in Fresno County, but moved its production and purchases westward to tidewater at Port San Luis, from which it was transported in tankers to either its Oleum refinery near San Francisco or the Wilmington refinery, at Los Angeles harbor. In addition to crude and fuel oil moved to these points, Union shipped out a substantial quantity of fuel oil to foreign parts, notably to Tocopilla, Taltal and Antofagasta, Chile.

The importance of tankers in the movement of crude is further indicated by the fact that the greater part of Kettleman Hills' production is moved to refining centers from Estero, Monterey and Port San Luis by water. In the Ventura Avenue Field, all but a small part of the total production has been moved to refining centers by tankers. The Elwood Field of Santa Barbara County, Capitan and the Santa Barbara Mesa fields are other districts dependent on tanker movement for the transportation of oil to refining centers. Production of the San Miguelito Field is also moved out by tankers, as the oil from this district is moved over and commingled with Ventura Avenue production.

Submarine Pipe Lines

Use of tankers for the transportation of crude has necessitated installation of several submarine pipe lines. Marine loading facilities of this type have become an important factor. These relatively short lines are exceptionally efficient both in operation and the dispatch with which tankers are loaded. Ocean tides have become of relatively no importance as the seaward end of all submarine loading lines in California are in approximately 50 feet of water. The movement of crude oil and natural gasoline to tanker fleets through submarine loading lines has been so common maximum loads are taken even in the roughest weather and during low tide. There are 11 submarine pipe lines in use in California. Standard has four submarine loading lines; Associated, three; General Petroleum, two; and Rio Grande Oil Co. and the Bankline Oil Co., one each. Standard has two submarine loading lines at Estero and two at its El Segundo refinery in southern California. It has one submarine loading line at Estero with a diameter of 16 inches and another of 18 inches, the latter the largest and heaviest submarine pipe line laid in California. Standard's primary submarine pipe line at El Segundo consists of 3,200 feet of 16-inch pipe, which enters the water at the seaward end of a wharf which extends into the surf for 2,200 feet. This 16-inch submarine line is tied into Standard's El Segundo tank farm by a 20-inch pipe line extending from the outer or seaward end of this wharf.

Associated Oil Co., which pioneered submarine pipe line construction on the Pacific Coast by laying a 10-inch line at Ventura in 1924, has three submarine loading lines on the Pacific Coast. At Ventura the company has a 3,500-foot submarine loading line and a similar one at the Monterey marine terminal. An 8-inch gasoline line was laid by the company at Monterey in 1925. General Petroleum has a 2,885-foot 10-inch welded submarine pipe line at Capitan in Santa Barbara County and 2,510 feet of 13⅜-inch submarine line at Davenport, the latter laid to make pipe line deliveries direct to the Santa Cruz Portland Cement Co. Rio Grande Oil Co. installed the first submarine loading line at Elwood by laying 4,000 feet of welded 10-inch pipe in June, 1929. Bankline Oil Co.'s installation in the Elwood Field consists of 3,800 feet of 10-inch welded pipe. All submarine pipe lines are equipped with the usual flexible rubber hose. Tankers are held in position by guide lines of 3-inch manila rope.

Standard Oil Co. has three pipe lines from the San Joaquin Valley area terminating at Estero in San Luis Obispo County. Its first line to tidewater at Estero was a 10-inch crude line laid from Kettleman Hills about five years ago. This was followed by installation of an 8-inch natural gasoline line from Kettleman Hills to Estero and a third line from Rio Bravo in Kern County. The Rio Bravo-Estero line is a black oil line 12 inches in diameter and the entire 108 miles was electrically welded. General Petroleum early this year com-

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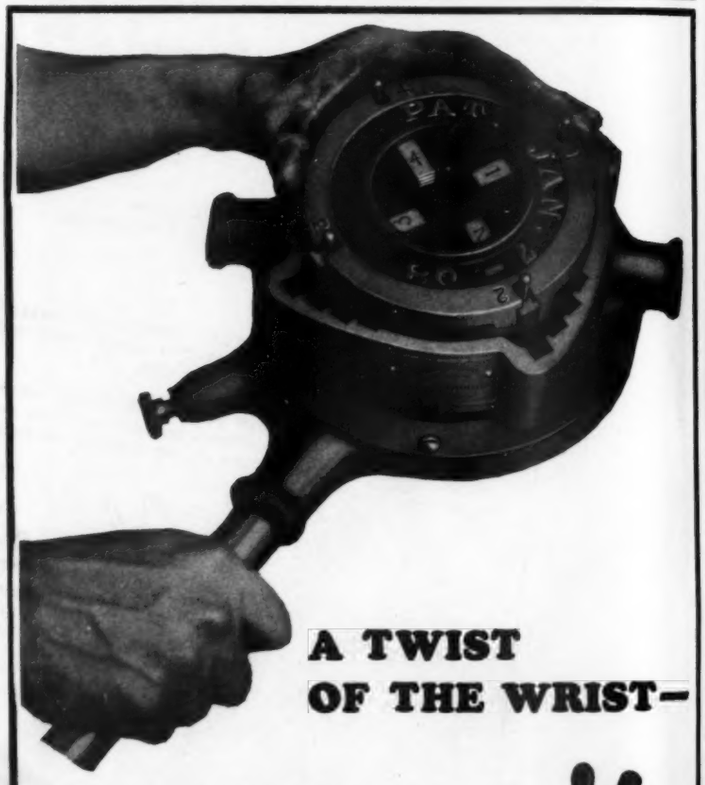

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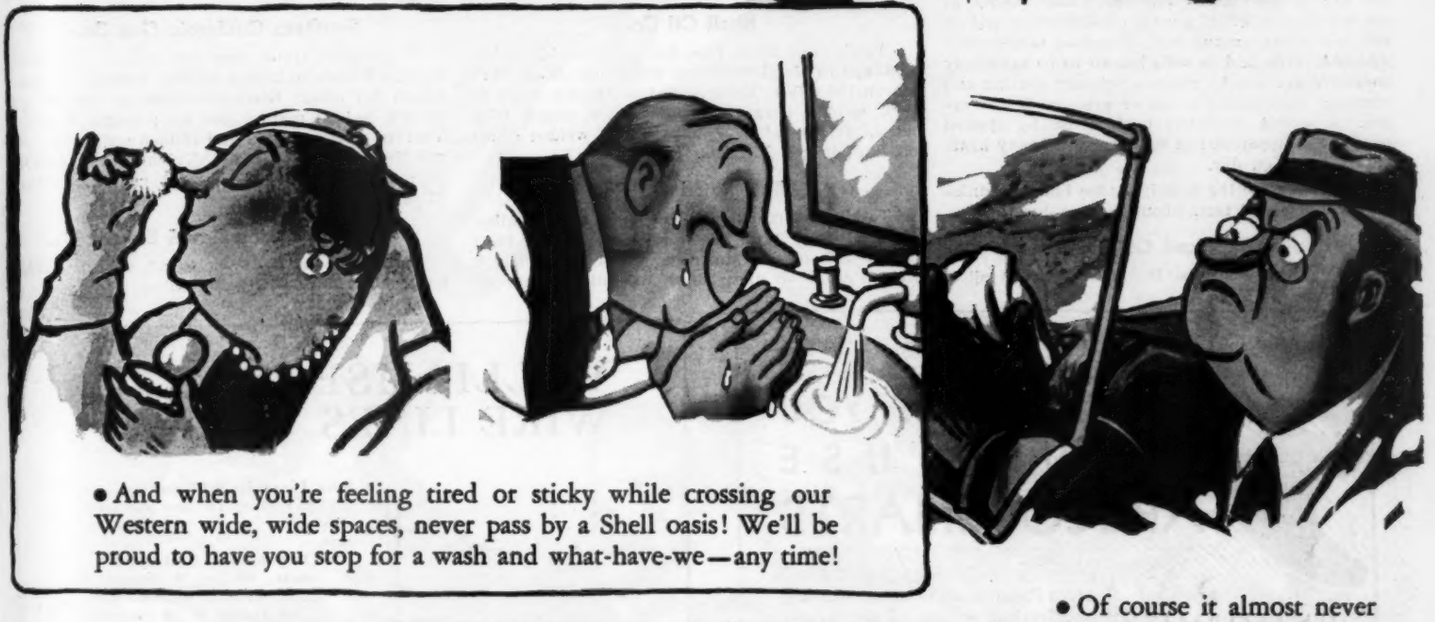

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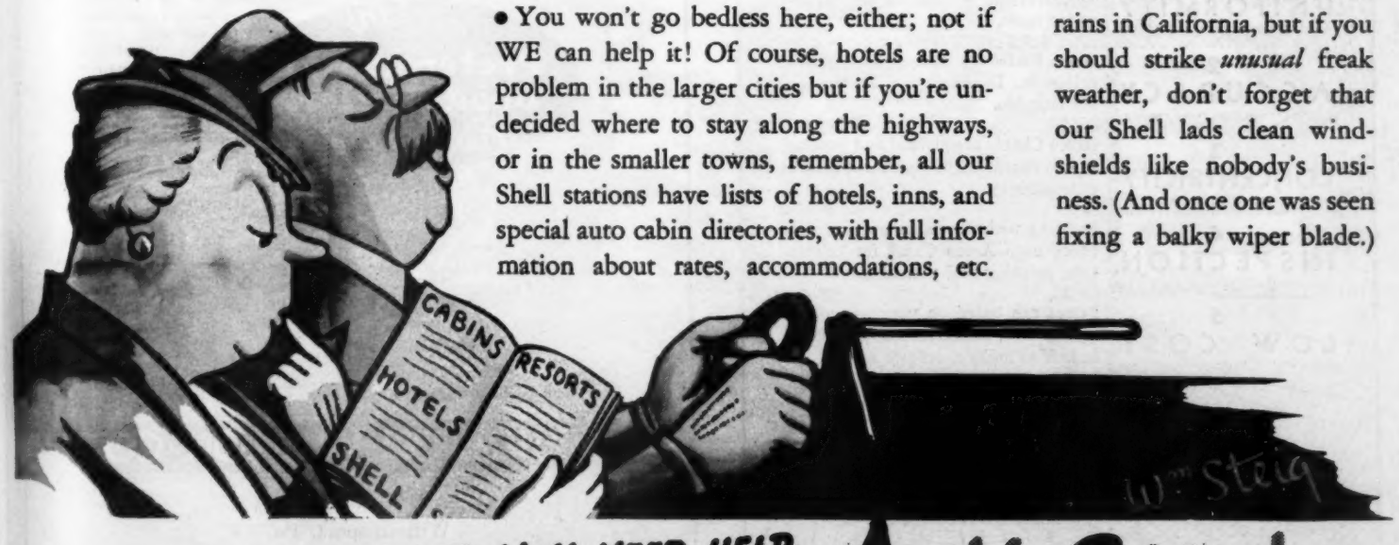

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pleted an 80-mile pipe line from Lebec to Torrance, consisting of 10-inch seamless pipe and, because of extremely high pressures, 15 miles of the new line on the outgoing end from Lebec and Roscoe pump stations was of heavy 40-pound grade. General Petroleum used double bell end pipe with chill or back up rings to facilitate welding operations and insure tight connections between sections. As far as is known this is the first time that this type of pipe has been used in the construction of a primary oil pipe line in California.

California pipe line companies do not encounter as severe operating conditions as companies in the Mid-Continent and Gulf Coast and consequently internal and external corrosion is a matter of minor importance compared with similar problems in other districts. Pipe line companies make periodic tests in the field along pipe line rights of way and are also conducting laboratory tests to determine soil corrosivity. Operators are using, to some extent, a wet and dry method in the field to determine the corrosive properties of soil by measuring the resistivity under both conditions. The wet test consists of adding two ounces of water in holes made in the soil to the depth of the line being tested. The dry test consists of measuring the resistivity with its normal content of moisture at the time the test is conducted. There is no generally accepted standardized procedure with reference to the coating of pipe lines or use of other protective measures and a number of methods are in use. Areas showing a high degree of corrosivity are given special consideration and in the bad lands coating and wrapping is generally adopted. Pipe laid in soils known to be extremely corrosive are usually given a primary coating and wrapped with either a rag or asbestos felt wrapper. A second protective coat is usually applied over the wrapper and in some cases a heavy kraft paper is put on dry.

Following are the principal pipe line companies in California and facts about their systems:

Standard Oil Co.

Total main trunk pipe line mileage, 3,000 miles. Kettleman Hills to Estero 10-inch welded crude oil line; length 68 miles. Kettleman Hills to Estero 8-inch welded natural gasoline line; length 68 miles. Kern River to Estero 12-inch welded crude oil line; length 111 miles. Coalinga to Richmond 8-inch welded crude oil line; length 194 miles. Huntington Beach to El Segundo two 8-inch welded crude oil lines; length 35 miles. Richfield to El Segundo 8-inch welded crude oil line; length 42 miles.

Union Oil Co.

Total main trunk pipe line mileage, 1,053 miles. Kettleman Hills to Port San Luis 6-inch welded natural gasoline line; length 82 miles. Midway to Port San Luis two 8-inch welded crude oil lines; length 116 miles. Orcutt to Port San Luis 8-inch welded crude oil line; length 33 miles. Orcutt to Port San Luis 6-inch welded natural gasoline line; length 31 miles. Richfield to Wilmington 8-inch welded crude oil line; length 33 miles. Huntington Beach to Wilmington 8-inch welded crude oil line; length 22 miles.

General Petroleum Corp.

Total main trunk pipe line mileage, 725 miles. Lost Hills to Lebec 8-inch welded crude oil line; length 85 miles. Lebec to Torrance 10-inch welded crude oil line; length 88 miles. Newhall to Wilmington 8-inch welded crude oil line; length 55 miles. Richfield to Vernon 6-inch welded crude oil line; length 28 miles.

Shell Oil Co.

Total main trunk pipe line mileage, 510 miles. Coalinga to Martinez 8-inch welded crude oil line; length 195 miles. Ventura to Los Angeles 4 and 6-inch welded natural gasoline line; length 97½ miles. Inglewood to Watson 6-inch welded crude oil line; length 22 miles.

Associated Oil Co.

Total main trunk pipe line mileage, 875 miles. Kern River to Avon 8-inch welded crude oil line; length 277 miles. Maricopa to Mendota 8-inch welded crude oil line; length 100 miles. Santa Fe Springs to Watson 8-inch welded crude oil line; length 20 miles. Belridge to Monterey 6-inch welded crude oil line; length 165 miles. Inglewood to Watson 6-inch welded crude oil line; length 21 miles. Huntington Beach to Watson 8-inch welded crude oil line; length 20 miles.

Richfield Oil Co.

Total main trunk pipe line mileage, 290 miles. Midway-Sunset to Long Beach 10-inch welded crude oil line; length 173 miles. Inglewood to Watson 8-inch welded crude oil line; length 21 miles.

Texas Co.

Total main trunk pipe line mileage, 200 miles. Montebello to Watson 6-inch welded crude oil line; length 40 miles. Santa Fe Springs to Watson 6-inch welded crude oil line; length 30 miles.

Pacific Gas & Electric Co.

Total main trunk pipe line mileage, 601 miles. Buttonwillow to Kettleman Hills 16-inch welded natural gas line; length 49 miles. Kettleman Hills to Mendota 22-inch welded natural gas line; length 40 miles. Mendota to Milpitas 20-inch welded natural gas line; length 110 miles. Milpitas to San Francisco 20-inch welded natural gas line: length 45 miles. Milpitas to San Francisco 22-inch welded natural gas line; length 47 miles. Milpitas to Oakland 20-inch welded natural gas line; length 36 miles.

Southern California Gas Co.

Total main trunk pipe line mileage, 534 miles. Taft to Glendale 12-inch welded natural gas line; length 107 miles. Kettleman Hills to Taft 20 and 22-inch welded natural gas line; length 76 miles. Ventura to Newhall 12 and 16-inch welded natural gas line; length 57 miles. Tejon to Los Angeles 22 and 26-inch welded natural gas line; length 77 miles.

Standard-Pacific Gas & Electric Co.

Kettleman Hills to Richmond 20-inch welded natural gas line; length 200 miles.

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Drilling and Production Practices in California Show Deep Well Trend

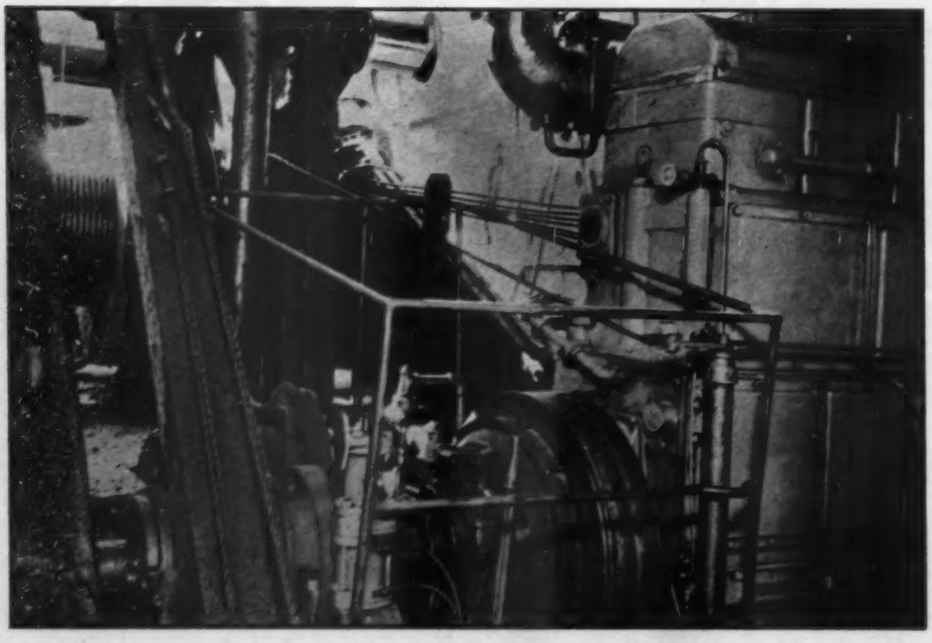
California operators have greatly increased drilling efficiency during the past year because superintendents have been instructed to keep on bottom, as all time off bottom is considered as lost time. One company has adopted the plan of having the crew go back in the hole before the core is removed. This is the practice carried out when coring for markers and obviously would be subject to certain changes when coring for oil sand. Contract drilling in California, although increasing in scope and application, has not become as general as in other sections of the country. There is, however, a tendency toward more contract drilling in areas where a definite objective can be assigned, as, for instance, at Kettleman Hills. There is also a very definite trend toward contract work in rig building and most of the larger companies now contract all rig building. Several operators are awarding contracts to contractors covering abandonment of wells. The latter contracts provide for recovery of any pipe landed and specifications call for compliance with regulations of the California State Mining Bureau.

Directional drilling, which has become such an important factor in the Huntington Beach and Long Beach fields during the past few years, is destined to become of far greater importance within the near future as this work can be used to good advantage, notably in the Playa Del Rey and Seal Beach fields, where the marshy terrain necessitates the construction of new roads and building of strong rig foundations. Directional drilling should also prove especially important in the San Miguelito Field of Ventura County due to the rough topography, which requires considerable preliminary work in the construction of roads and extensive excavation work to provide locations for rig sites. This area is very rugged and in some parts it is almost impossible to make normal locations due to the precipitous conditions of the region.

Modern steam drilling rig in California

Deep Drilling

The 10,000-foot era has arrived and within the next few years California operators will be going down to 15,000 feet or more in search of commercial production, provided equipment manufacturers keep up the present pace, which has practically always been a jump or two ahead of the drill. A depth of 15,000 feet seems almost unattainable in view of present conditions, but so was 10,000 feet less than a decade or so ago. It is quite obvious, of course, that considerable research is still necessary in order to fabricate equipment that will withstand high temperatures and severe stresses and permit the drilling of deep wells with a normal degree of safety. It is the belief of drilling superintendents and executives in charge of drilling operations that a depth of 15,000 feet is within the realms of probability and may be reached within the next few years if necessity demands. This opinion is qualified by several competent engineers by the statement that it may be necessary to modify the draw works and design drill pipe to withstand the resulting additional strain. High tensile strength would be a primary requisite and this might require the use of some heat resisting or strengthening alloy. In view of the fact that Tertiary deposits in the Ventura Avenue Field approximate 35,000 feet, it is quite obvious that this field is susceptible of deep drilling and may become the proving ground for equipment necessary for this type of work. Any equipment capable of drilling to 15,000 feet in the Ventura Avenue Field has sufficient durability to greatly exceed this depth in other areas because Ventura Avenue is one of the toughest fields to drill in the State due to natural obstacles. Hard, shifting and squeezing formations must be penetrated to great depths in the face of heavy gas pressure in order to reach the best producing zones. As a result, the Ventura Avenue Field has the reputation of being the most difficult field in California in which to complete a well. These problems will be further intensified during the next decade as a result of deeper drilling. In order to reach a depth of 15,000 feet, it will be necessary to start with a bigger hole and, as a consequence, long strings of large diameter pipe having high tensile strength will be utilized.



Direct-connected reversible Diesel rig in California

Drilling Fluid

It is quite obvious that in the drilling of deep wells drilling fluid of the proper type and characteristics is necessary, not only to insure positive circulation but also to minimize drilling hazards and reduce to a minimum the possibility of twist offs and stuck drill pipe. It is impossible to single out any piece of equipment or operating condition as the most important factor in deep drilling, because each is a contributing influence in the successful culmination of work. It can be

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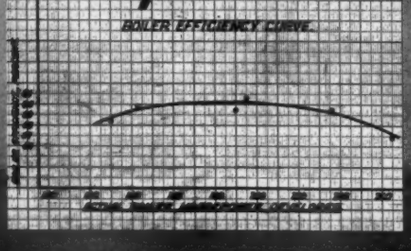

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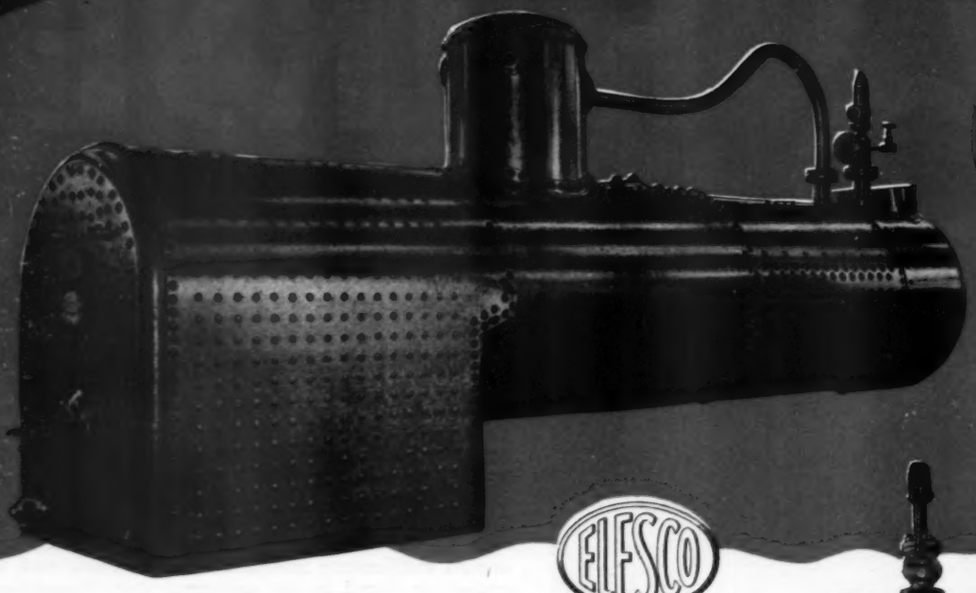

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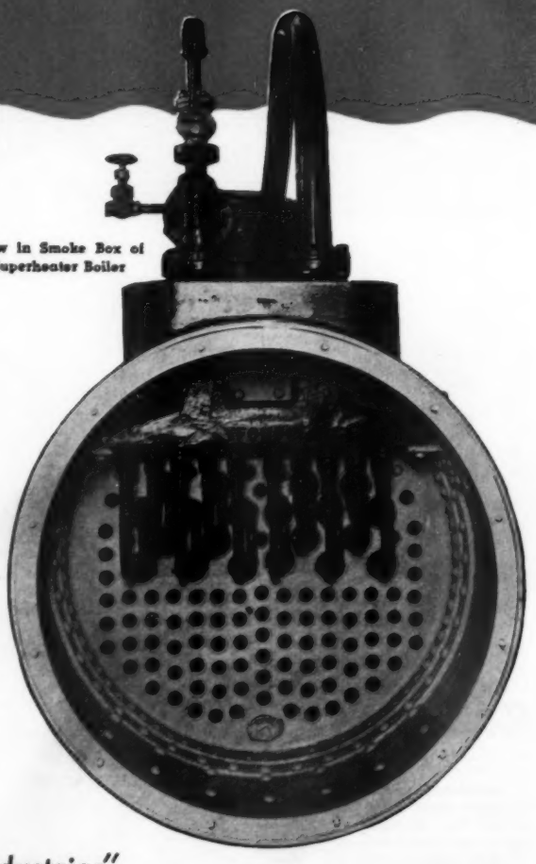

View in Smoke Box of Superheater Boiler

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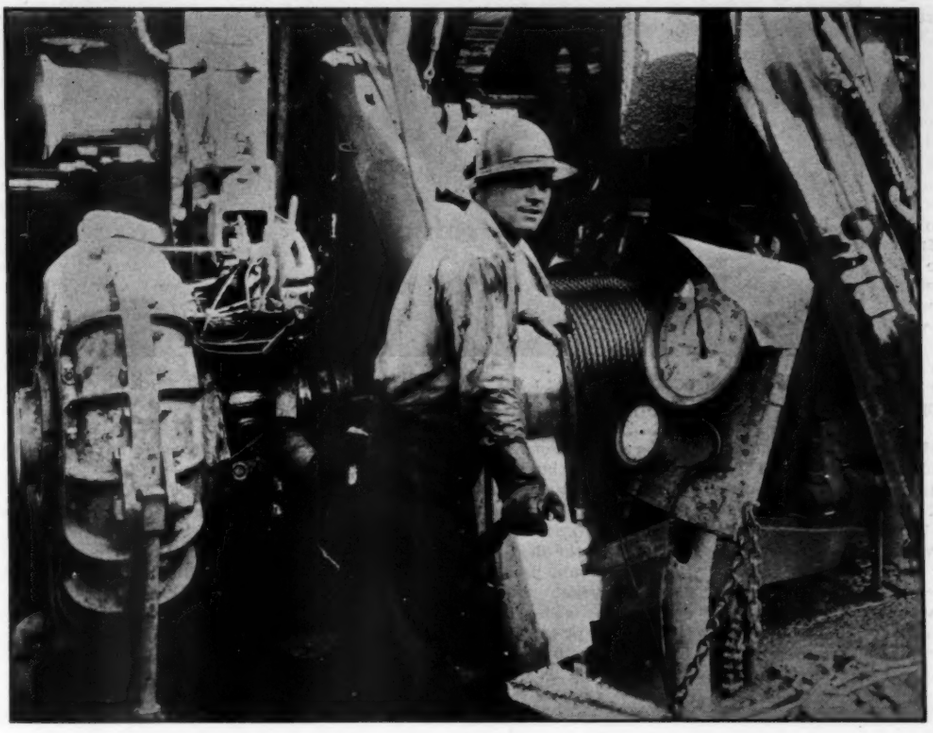
stated without fear of contradiction, however, that drilling fluid is as important as any other factor in deep drilling and because of this, considerable attention is being devoted to the selection of drilling mud. In order to meet specifications, the mud selected must have, among other things, maximum wall forming qualities, excellent sealing ability and be able to retain water and prevent it from filtering through.

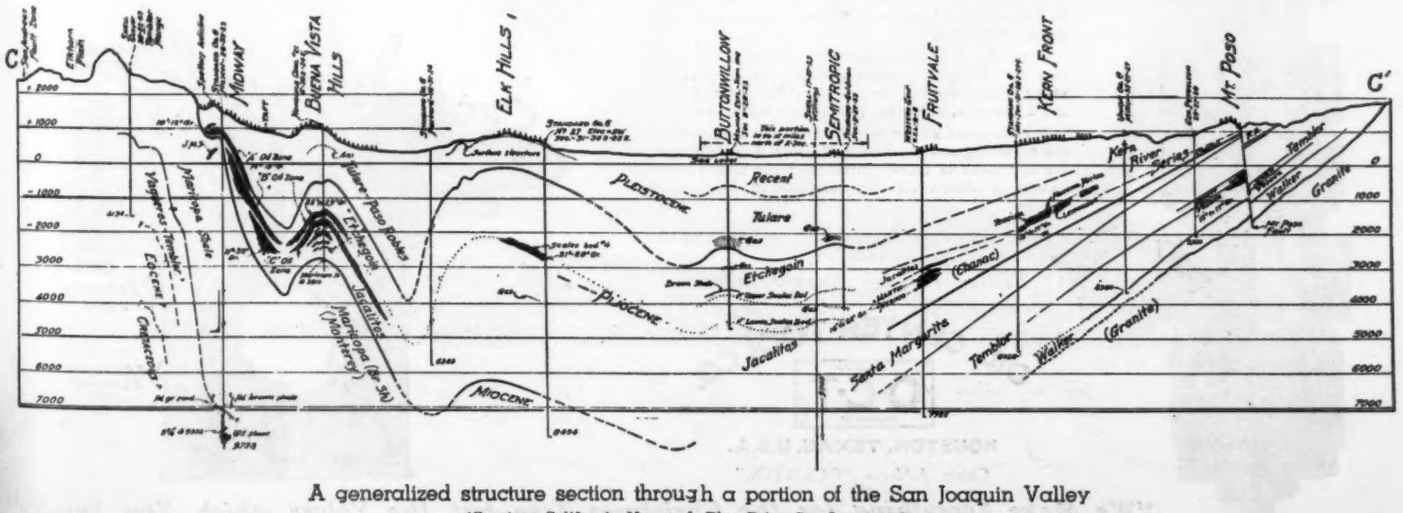
During the past year or so, the use of slough mud has come into rather general use in the drilling of deep wells in California with excellent results. This practice has become so general that operators are having considerable difficulty finding enough sloughs to meet requirements. The Union Oil Co. has been using slough mud for several years. The Kettleman North Dome Association and Standard Oil Co. are using it with excellent results in the Kettleman North Dome Field and the Shell and Associated have utilized it in drilling operations in the Ventura Avenue Field. The best grades of slough mud are comparatively free of sand or other abrasive substances. Centralized plants for the desanding and reconditioning of rotary drilling mud are in operation in the Kettleman Hills, Santa Fe Springs, Ventura Avenue and Playa Del Rey Fields and this has been an important factor in increased efficiency of development and lower operating costs by eliminating frequent replacement of drilling mud and reducing the wear and tear on pumps and other operating parts.

There appears to be a tendency on the part of some operators to decentralize control of certain parts of drilling equipment with the result that the rotary table in some assemblies is driven by a separate engine and operates independently of the hoisting engine and draw works. This is a relatively new development in California. Integrated units have some inherent advantages and will predominate in a number of fields due to simplicity of design and adaptability to changing conditions. Mud pumps driven by a separate engine are also coming into more general use due to the resulting steam economy. This is particularly true in areas where water is not any too plentiful. Double deck traveling blocks are also coming into more general use. Most draw works are of conventional type, although some greatly refined designs are in use. The hydraulic brake occupies a prominent position in California equipment, especially in fields where deep drilling predominates. New swivels, tables, hooks and elevators are undergoing tests in several fields that are considered excellent proving grounds. There is a marked trend toward a reduction in rig irons. The Associated Oil Co. is using a direct reversible Diesel engine on No. 136 Lloyd in the Ventura Avenue Field of California, which is a 400 horsepower, 600 r.p.m., eight-cylinder Diesel, and is successfully meeting all demands. This engine is driving a rotary table and draw works through a 24-inch twin disc clutch, the assembly being mounted as a single unit. The clutch is built into the flywheel of the engine and is operated by an air ram, controlled by a small lever which is installed at the driver's post. Compressed air is supplied by an electric motor driven compressor located in the derrick under the pipe rack and circulating water is furnished by an enclosed type of cooling tower located in an elevated position on a hill about 150 feet from the rig. Water and oil pumps are driven separately by electric motors in order to confine operation of the Diesel engine to the draw works and rotary table. A flexible coupling is located beyond the twin disc clutch and beyond this there is an extended shaft supported on both ends with self-aligning ball bearings. A standard sprocket driving the draw works shaft with a standard rotary chain is mounted on the shaft. There are no intervening jack shafts or clutches between the engine and the draw works in as much as the engine is direct reversing and the releasing of the jaw clutches is done by reversing the engine. Tentative plans contemplate the use of one of the latest type draw works in conjunction with this engine in the near future.



Drilling control on Diesel rig in California with hydromatic brake at left

California operators are using steam, electrical energy and Diesel engines in the drilling of wells and, in one instance, compressed air was used satisfactorily for drilling power. The use of alternating current in drilling operations extends over a period of several years, but it was not until 1930 that direct current received much consideration in California development work. Experimentation in the use of direct current by the Union and Standard, although basically the same, differ in the power used for generation of electrical current and the adaptability of each type of equipment for general work. The Standard's primary installation, located in the Inglewood Field of Los Angeles Basin, is more or less of a permanent nature, while the Union's electric drilling outfit was of the portable type. The Standard adopted Diesel engines for the generation of energy, while the Union concentrated on the use of gasoline engine power as a prime mover. The Union has used its portable machines for several years in the drilling of shallow wells. The generating units, consisting of gasoline engines, direct current generators and exciters, are permanently mounted on trailers and can therefore be located at a safe distance from the well. The engines are rated 150 horsepower at 1,000 r.p.m. and consume 5 bbls. of engine distillate during a 24-hour period. The Standard Oil Co.'s hook-up consists of a variable system for direct control, which differs from alternating current in that the operator controls the generators instead of the motors. It is based on the solid injection, full Diesel principle which



A generalized structure section through a portion of the San Joaquin Valley

(Courtesy California Map and Blue Print Co., Los Angeles.)

utilizes oil of proper gravity and heat unit value. A number of years ago the Shell Oil Co. utilized Diesel equipment in the Brea Olinda Field of Los Angeles Basin as the prime mover when drilling No. 2-A Puente from the grass roots down to 5,825 feet. This installation consisted of a four-cylinder, 150-horsepower Diesel drilling engine driving through mechanical transmission and a three-cylinder, 110-horsepower Diesel engine driving the mud pumps. This installation is particularly interesting because it indicates that the trend several years ago was toward decentralization through the use of separate engines to power certain operating units.

The Barnsdall Oil Co. has conducted a series of tests in the Elwood Field of Santa Barbara County to determine the feasibility and practicability of using compressed air for drilling power. After ironing out the usual amount of difficulties which are to be expected in departing from standardized practice, the installation functioned satisfactorily. The experiment with the use of compressed air was made possible because the company had available in the field a surplus amount of equipment capable of supplying power. The company, following the decline in production of the Vaqueros in the Elwood Field, had a battery of 24 gas compressors, some of which were idle. The company accordingly decided to utilize these compressors and nine of these gas compressors were blocked off and converted into air compressors. In order to deliver the compressed air to the well at the highest possible temperature, the company designed and installed an air heater, which consists primarily of a section of a steel caisson similar to that used in pier construction, and a number of 1-inch pipe tubes. The expense incident to conducting this experiment was relatively insignificant and as yet no data have been compiled regarding the cost of operation. Approximately 5,000,000 feet was the highest consumption during any 24-hour period.

Larger Derricks

There is a very definite tendency toward the use of larger derricks and this will become of more importance with deeper drilling. The use of larger derricks has not yet become a factor of any great consequence in California up to the present time, but superintendents and heads of operating departments recognize the advantage from an efficiency standpoint of using a larger floor space, which would also increase the working space up in the derrick. It is the general thought that rigs would probably be standardized around 150 feet, which will on standard equipment increase the working space on the floor of the derrick. Under present conditions, there is very little freedom of action in the standard 122-foot derrick when 9,000 or 10,000 feet of drill pipe is standing in the rig, which has a 26-foot base. In 1931, the Superior Oil Co., when drilling No. 3 Huffman in the North Dome, used a super-rig with an A.P.I. rating of 174 feet. The safety factor on this rig was approximately 1,000,000 pounds as compared with about 750,000 pounds for the average derrick. This rig had a 32-foot base and permitted the crew to pull 132 feet of drill pipe. It may be found advantageous to use derricks of this size when drilling to the 15,000 foot level, but for holes down to 12,000 feet it would appear that a 150-foot rig should prove ample to meet normal requirements.

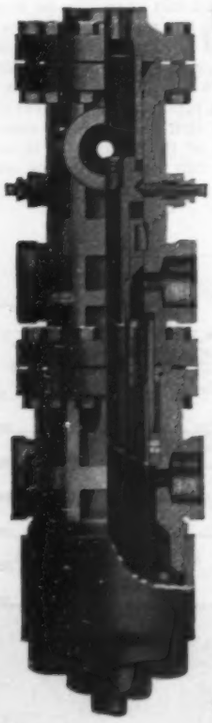
Steam engine direct-connected to rotary table and operating independently of hoisting engine and drawworks

The Union Oil Co.'s field department developed and perfected a new design of rotary drill pipe in 1934 and this was subsequently accepted by the American Petroleum Institute as a tentative A.P.I. standard. This new drill pipe is a full hole, or flush inside diameter drill pipe in contrast with the old type, because it has a uniform bore from top to bottom, whereas the standard type of drill pipe has a restricted inside diameter at each joint because of upsetting and because at each 40 feet of drill pipe there is a further restriction because of the small bore through the tool joints, which are made on a taper for quick breaking out and screwing together when running in or coming out of the hole. The Union is using several thousand feet of this new full hole drill pipe in No. 1 Lillis-Welsh, a deep test in the Kettleman North Dome Field, and in two wells which the company is drilling in the North Belridge Field of Kern County. Previously, it was used in the drilling of wells to a depth of approximately 6,000 feet but is now being utilized in drilling operations substantially below the 8,000-foot level.

The difference between the two types of drill

Simplifying Surface Hookups Like This—

MAKES YOUR JOB SO MUCH EASIER *and SAFER*



NEW O-C-T TYPE "C-3" BRADENHEAD WITH "AS" STREAMLINE TUBING HEAD MAKES TROUBLE-SAVING COMBINATION

It eliminates all nipples between the oil string and the Christmas-tree, because it permits flanging the entire 'tree assembly right onto the Bradenhead, which screws into surface casing collar.

It permits flanging blowout preventer equipment on top of Christmas-tree body before drilling the plug. Thus you can drill in, run and land tubing in body of the 'tree before removing blowout preventer equipment.

Type "C-3" Bradenhead gives a double pack-off, one set of packing sealing around casing and the other sealing around the casing collar, thereby making a positive, safe seal around the oil string.

It eliminates all threads between the Bradenhead, the oil string and the Christmas-tree. It is furnished for any make of valves, although male thread valve design is shown on the combination hookup, at the left.

Furnished in test pressures up to 6,000 pounds.

Selling through Supply Stores

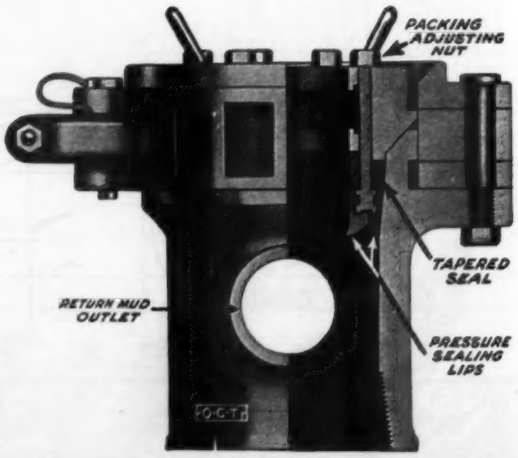
OIL CENTER TOOL CO.

QUALITY O-C-T PRODUCTS

HOUSTON, TEXAS, U.S.A.

Cable Address "OCENTOL"

O-C-T Type "D" Blowout Preventer (shown below) allows the operator to drill in and run casing and tubing under pressure with complete safety. It allows working of drill pipe (with preventer packing unit latched around it) up and down the length of one joint, or rotation of drill pipe, to prevent sticking while the well is being killed. This, or any other make of preventer, may be readily flanged on top of the new O-C-T combination surface hookup, through use of O-C-T Adapters made for this purpose.



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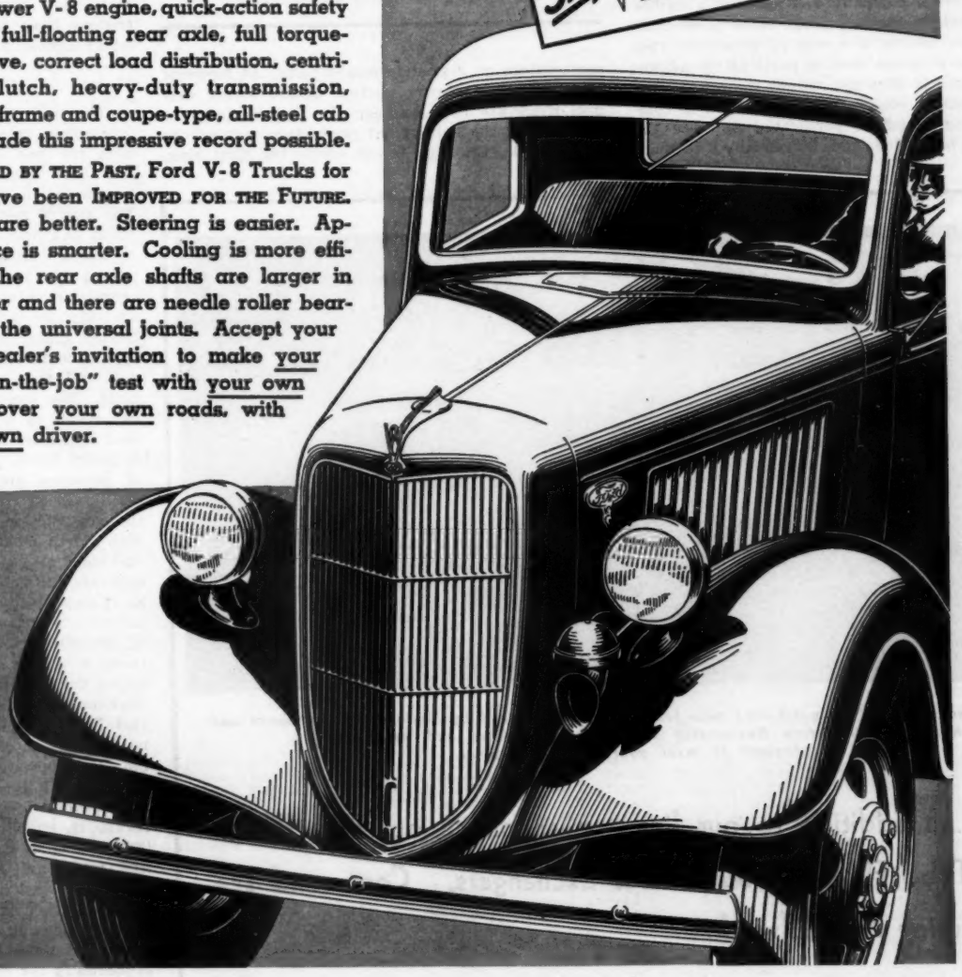
PROVED BY THE PAST, Ford V-8 Trucks for 1936 have been IMPROVED FOR THE FUTURE. Brakes are better. Steering is easier. Appearance is smarter. Cooling is more efficient. The rear axle shafts are larger in diameter and there are needle roller bearings in the universal joints. Accept your Ford dealer's invitation to make your own "on-the-job" test with your own loads, over your own roads, with your own driver.

Proved BY THE PAST
Improved FOR THE FUTURE



pipe is evidenced by a comparison between the types in question. In the standard type, the 4½-inch outside diameter drill pipe has an inside diameter at the upset ends of 2⅛ inches while the bore through the tool joints is 2¼ inches and the outside diameter of the tool joint, 5½ inches. The Union's full hole drill pipe has an inside diameter of 3.181 inches with external upset and 4½ inches in outside diameter. The latter dimension is the same as the original 4½-inch drill pipe and thus permits the same thread gauges for coupling and tool joint pipe threads used on the old type of 4½-inch pipe. The same relative differences follow through on all sizes of pipe, by simply transferring the upset from within to outside and utilizing the same pipe thread gauges now in use in internal upset drill pipe. The full hole drill pipe can be used for all methods of testing, cementing and recementing where formerly it was usually the practice to use a string of tubing when making water tests or recementing. In as much as the pipe is bored true to gauge, it can be used for swabbing operations or in making a pumping test and is also suitable in making formation or casing tests by bailing or swabbing. A core barrel designed to be used in conjunction with this full hole drill pipe is being developed. The barrel is pumped down through the drill pipe and is held in position either by pump pressure or by mechanical means. The inner barrel, which projects out through the core shoe, can be recovered and brought to the surface by reversing circulation and thus permit frequent examination of core samples without removing the drill pipe from the hole until it is necessary to replace the coring shoe.

Production Tests

One California company has adopted a rather unique method of making progressive production tests in areas having a series of relatively thin sands and the program used is particularly advantageous because it does not reduce the size of the hole. The method consists of running in a combination string which is perforated opposite the measures to be tested and is cemented through perforations at a predetermined point. At frequent intervals in the lower portion of the string cast iron rings are used to keep the pipe centered in the hole. If the subsequent production test proves unfavorable, the pipe is cut above the first ring, which field men designate as doughnuts, and the upper portion removed. The lower portion of the hole containing the cast iron rings is then washed over with wash pipe and removed in the usual manner. The company has made a number of tests in this manner, especially on wildcat wells, and in no instance up to the present time has it required more than 24 hours to recover the lower part of the combination string, which had been cut out and left in the hole. The secret of this success, of course, lies in the fact that the so-called doughnuts keep the pipe centered in the hole and thus facilitate the fishing job.

John Barneson, founder,
General Petroleum Corporation

In several southern California fields, gas operated pumpers are showing considerable merit, especially in fields where gas is available under moderate pressure. The operation of jack plants is more uniformly used in the San Joaquin Valley than in productive areas in the southern part of the State, where individual pumping units predominate. Slow pumping, which has probably received more attention and has been applied more extensively in California, is a factor of importance in San Joaquin Valley fields, where extremely slow and moderate speeds have been attained cheaply and efficiently. Gas lift operations have come into more general use, although present application is in a much simpler form than that which prevailed a few years ago. Gas injection has been reduced to a minimum and the storage of natural gas has practically been discontinued in California fields due to the lack of natural gas in the areas susceptible of such development and the absence of fields that are held closely enough to justify such work. Limited repressuring and re-injection of current production of natural gas is still being done in the Dominguez, Santa Fe Springs and Kettleman North Dome fields in areas where operators have been able to work out a mutually advantageous program.

Orifice Meters

The use of orifice meters to record continuous production from individual wells and thus eliminate the use of gauging tanks and separate oil and gas lines from wells to central points of accumulation, is coming into more general use. The use of meters in the Kettleman North Dome Field has proven quite successful, as special care is taken during the installation to assure elimination of gas and the proper allowance for the change in volume of oil upon release of pressure. In order to increase operating efficiency at Kettleman Hills, the Kettleman North Dome Association constructed a gas mixing header a few months ago and this installation has proven very efficient. The construction of this mixing header is the result of a survey conducted some time ago that indicated that natural gas produced from the so-called Elliott gas zone contained a larger amount of pentanes and heavier hydrocarbons than wet gas produced from the black oil zone. Previous to the construction of this mixing header, the Kettleman North Dome Association delivered the white and black oil gas to natural gasoline plants through separate lines, but this plan was not satisfactory as it necessitated the calculation of theoretical recoveries. The installation was built for a capacity of 200,000,000 feet per day and under such a load there would be approximately 120,000,000 feet entering the header from the black oil zone and approximately 80,000,000 feet of white oil gas. The two lines carrying these two varying grades of natural gas enter a 26-inch header at right angles but from opposite directions and at different points although all lines are in the same plane. The 26-inch header is connected with two 5 by 12-foot scrubbers, each of which has a capacity of 100,000,000 feet of natural gas per day. Natural gasoline, water and crude oil are effectively removed and discharged by a float mechanism to the condensate gathering system. The clean and thoroughly mixed gas is brought together again at a 22-inch master meter, where it is afforded another opportunity for mixing before it is discharged into an additional 26-inch header for distribution to the various natural gasoline plants for processing. A series of tests are made from time to time and the results have proven to be almost identical. Charcoal tests taken at the master meter on each of the distributing lines have shown similar average gasoline contents and the same has been true of tests covering specific gravity.

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World Market of California Depends on Discoveries of New Oil Reserves

During the past decade, California marketers have disposed of substantial quantities of crude and refined oils along the Atlantic seaboard for domestic consumption and have at the same time sold a considerable amount of petroleum in many parts of the world. California's biggest customer at the present time is Japan and the Orient and if the Standard Oil Co. continues shipping Kettleman Hills crude to the Raffinerie du Nord at Dunkirk, France, this will place Europe as an important consumer of California oil.

Japan Has Been Best Customer

Japan has been California's best customer for the past several years as far as quantity is concerned, but this business has not been especially remunerative as California marketers have used this outlet as a dumping ground for excess production of crude oil. Several of these crude oil contracts are based on the field price for crude oil plus a nominal pipe line and loading charge. It is obvious that this business does not yield a return commensurate with the value and quantity of oil involved. The Associated Oil Co., through part ownership of the Mitsubishi refinery in Japan, is in a more advantageous position because the company in addition to supplying the necessary crude oil participates in refinery operations. Practically the only profit that has accrued to California marketers during the past year has been through the sale of fuel oil to commercial consumers in Japan and sales of the same product to the imperial Japanese navy. It is interesting to note in this connection that the price received for fuel oil shipped to Japan has closely approximated prevailing quotations in California and is on about a par with the price paid by the United States navy during the same period. The demand for crude and refined oil by the Japanese market has shown a consistent increase during the past several years. Several existing contracts which involve the shipment of crude and fuel oil to Japan will expire at the close of the current year and possibility of renewal depends upon the future outlook as far as California production is concerned and the ability of marketers to make additional commitments.

Consumption of crude and refined oil on the Pacific Coast has shown a consistent increase during the past several years, due undoubtedly to generally improved conditions in all lines of business. Fuel oil demand has shown an encouraging increase during the past five years and this is especially true in California, Washington, Oregon and Nevada. Depressed conditions in the mining industry in Arizona have been reflected adversely in the use of fuel oil. During the year 1931, commercial consumers in Arizona used 2,052,000 bbls. of fuel oil but the demand dropped to 625,000 bbls. in 1932 and declined to 460,000 bbls. in 1933. During 1934 Arizona used 752,000 bbls. of fuel oil and during 1935 to date there has been a further improvement. Railroad consumption of fuel oil in Arizona only totaled 6,000 bbls. in 1931 but increased to 27,000 bbls. in 1932. The demand dropped again in 1933 to 16,000 bbls., but increased to 155,000 bbls. in 1934 and has shown a substantial increase during the present year to date. Gas and electric companies used 381,000 bbls. of fuel oil in 1931 and 137,000 bbls. during 1932. This declined to 131,000 bbls. in 1933, increased to 210,000 bbls. in 1934, and at last reports was showing a material improvement during the current year.

Consumption by Utilities

With the exception of Arizona, the trend of fuel oil demand in other Pacific Coast states has been approximately the same. Fuel oil consumption by gas and electric companies has shown a consistent decline on the Pacific Coast during the past five years, due principally to the extension in California of natural gas transmission lines to San Diego in the south and the San Francisco Bay region in the north. During 1931, gas and electric companies in California used 1,765,000 bbls. of fuel oil, but this declined to 1,151,000 bbls. in 1932. Increased use of natural gas reduced the demand of gas and electric companies for fuel oil to 360,000 bbls. in 1933 and this was further reduced in 1934 when only 316,000 bbls. were required in the operation of these public utilities. The demand during 1935 to date is averaging approximately the same as during the past two years.

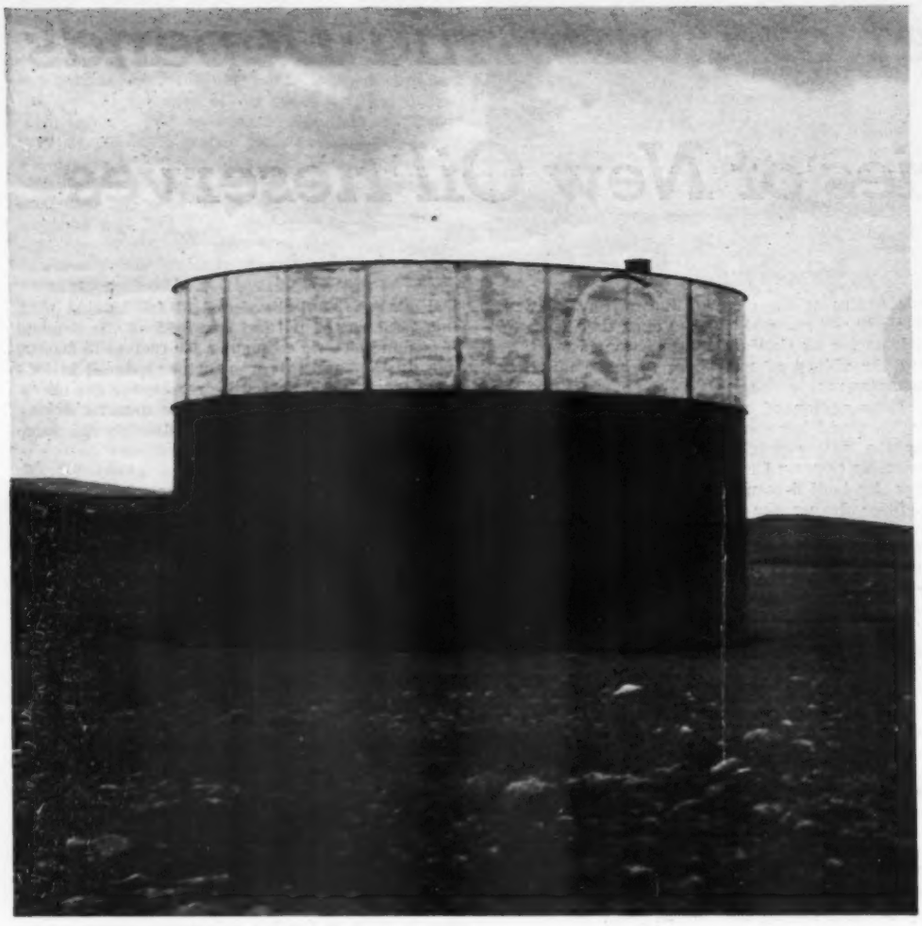
Consumption in Oregon

Gas and electric companies in the State of Oregon used 1,663,000 bbls. of fuel oil during 1931, but this dropped to 976,000 bbls. in 1932 and declined to 828,000 bbls. during 1933. A slight increase occurred during 1934 when 869,000 bbls. of fuel oil was required and preliminary reports indicate that utilization by gas and electric companies during 1935 will be in the neighborhood of 1,000,000 bbls. One of the most interesting developments in Oregon is the fact that, despite a lower demand for fuel oil by railroads, steamships and gas and electric companies, there has been a consistent increase in the use of fuel oil by commercial consumers. During 1931, commercial consumers in Oregon required 1,730,000 bbls. of fuel oil to meet the existing demand and this increased to 1,809,000 bbls. in 1932 and reached 2,013,000 bbls. in 1933. During 1934 commercial consumers used 2,396,000 bbls. and judging by the movement of fuel oil from California to Oregon during the present year to date, a further substantial increase will be recorded during 1935. This consistent increase in commercial consumption is especially interesting in view of the fact that the total amount of fuel oil used in the state showed a substantial fluctuation during the past five years due to variations in the demand by railroads and steamships. In 1931, public utilities and commercial consumers used 6,603,000 bbls. of fuel oil, and this dropped to 4,869,000 bbls. in 1932 but showed an increase in 1933 when 5,440,000 bbls. were required to meet the demand. During 1934 a total of 6,097,000 bbls. of fuel oil were used by consumers in the State of

Supply and Demand for California Petroleum

	Production			Tanker shipments			Refy. cons. and com'l. sales	Withdrawn from stocks					
1933—	Crude oil	Natural gasoline	Total income	Intercoastal	Pacific foreign	Atlantic foreign		Heavy crude and fuel	Refining crude	Naphtha distillates	Gasoline and C.H.G.	Other oils	Total stock decrease	Total outgo
January	14,460,282	1,068,849	15,529,131	1,865,195	3,500,310	591,976	10,401,591	377,587	59,861	67,264	*55,297	380,526	829,941	15,529,131
February	13,107,043	928,966	14,036,009	1,342,011	2,273,361	392,058	10,539,924	756,533	*628,328	107,787	187,742	107,711	511,445	14,036,009
March	13,414,980	926,672	14,341,652	963,217	2,671,855	81,428	10,917,863	264,841	*46,491	251,676	*62,947	*114,368	292,711	14,341,652
April	14,262,948	954,358	15,217,301	1,313,678	2,905,285	764,275	10,268,283	*1,178,381	435,289	495,097	313,757	*31,542	34,220	15,217,301
May	14,817,633	1,007,228	15,824,861	1,444,880	3,361,811	228,819	11,140,931	*2,076	827,794	*411,751	213,586	*375,972	251,580	15,824,861
June	14,344,654	943,068	15,287,722	1,182,341	3,298,086	410,495	11,544,015	*517,065	1,146,106	394,361	283,424	*159,611	1,147,215	15,287,722
July	15,140,828	974,700	16,115,528	1,654,640	2,636,718	286,390	12,330,892	*482,201	965,723	188,237	306,962	*185,609	793,112	16,115,528
August	15,536,841	1,026,262	16,563,103	1,316,032	3,011,626	438,129	11,196,684	85,172	*615,215	257,840	*287,828	*40,601	*600,622	16,563,103
September	14,673,846	1,007,830	15,681,676	1,674,182	2,196,731	146,955	12,488,123	515,503	75,900	47,711	57,769	127,432	824,315	15,681,676
October	14,665,011	1,041,509	15,706,520	2,658,892	2,526,721	399,121	12,000,980	2,269,835	*366,895	*179,817	279,047	*122,976	1,879,194	15,706,520
November	13,933,559	996,417	14,929,976	3,105,637	2,611,912	461,862	12,330,906	1,324,355	1,469,960	408,901	308,057	69,068	3,580,341	14,929,976
December	14,725,699	1,028,202	15,753,901	2,499,201	2,706,577	588,294	12,195,243	2,892,736	55,263	*402,884	*584,037	277,336	2,238,414	15,753,901
Total	173,083,319	11,904,061	184,987,380	21,019,906	33,600,993	4,789,802	137,358,535	6,286,839	3,378,967	1,224,422	960,235	*68,607	11,781,856	184,987,380
1934—														
January	14,163,468	1,020,490	15,183,958	2,567,356	2,975,258	261,484	11,237,298	2,420,173	234,571	24,929	*932,640	100,405	1,857,428	15,183,958
February	12,593,784	898,126	13,491,910	2,181,568	3,123,175	340,791	10,423,269	3,242,633	524,783	*369,703	*751,258	69,562	2,576,893	13,491,910
March	14,710,467	984,305	15,694,772	2,182,657	2,890,794	589,159	13,210,668	2,240,509	*722,272	814,386	785,177	60,706	3,178,506	15,694,772
April	14,472,785	955,204	15,427,989	2,506,029	3,121,798	462,308	12,269,700	2,119,772	183,427	5,074	609,827	13,746	2,931,846	15,427,989
May	15,070,718	984,768	16,055,486	2,518,039	3,316,282	670,030	11,635,527	2,050,983	292,302	23,225	38,109	*320,227	2,084,392	16,055,486
June	15,466,696	986,773	16,453,469	2,094,485	3,856,337	476,384	11,582,715	1,459,695	*134,509	*108,934	359,642	*19,452	1,556,452	16,452,469
July	16,054,232	1,056,869	17,111,101	1,716,989	3,139,934	431,298	10,988,200	457,823	*350,825	*142,046	*697,737	*107,895	*840,680	17,111,101
August	15,291,637	1,069,689	16,361,326	2,044,565	3,419,473	333,547	12,847,828	2,099,875	*429,654	190,781	561,851	*138,716	2,284,087	16,361,326
September	14,052,800	1,033,368	15,086,168	1,721,121	2,899,516	242,093	10,883,570	1,174,818	557,611	78,112	254,102	*289,289	660,132	15,086,168
October	14,463,794	1,063,319	15,517,013	1,804,828	3,518,311	512,291	12,885,264	2,569,228	*399,530	57,118	1,146,989	*170,124	3,203,681	15,517,013
November	14,335,381	1,002,828	15,338,209	2,296,261	3,735,080	644,837	12,780,451	3,037,095	*65,872	3,675	945,422	*198,120	4,118,440	15,338,209
December	14,842,804	1,030,004	15,872,808	1,083,370	3,489,465	526,671	12,703,065	2,385,171	*245,581	57,502	*118,222	*149,107	1,929,763	15,872,808
Total	175,508,566	12,085,643	187,594,209	24,716,268	39,485,423	5,490,883	143,442,585	25,267,775	*1,670,771	634,079	2,201,262	*891,395	25,540,950	187,594,209
1935—														
January	15,511,311	1,081,947	16,593,258	886,581	3,350,422	126,497	11,853,159	909,706	*270,504	*212,513	*688,992	*114,447	*376,749	16,593,258
February	13,959,063	943,981	14,903,044	1,222,993	3,293,845	463,761	10,733,430	373,642	348,941	*113,530	*131,605	344,537	821,985	14,903,044
March	15,481,203	1,038,386	16,519,589	796,599	4,262,228	243,345	12,745,609	1,311,938	578,757	148,422	*222,528	*288,397	1,528,192	16,519,589
April	14,174,149	960,439	15,134,588	1,004,939	3,205,335	668,750	12,539,968	643,324	1,503,938	*42,218	732,837	*253,477	2,584,404	15,134,588
May	15,342,221	937,544	16,279,765	856,631	3,826,753	903,219	12,996,127	*73,571	2,151,692	*142,533	526,709	*169,332	2,292,965	16,279,765
June	16,708,859	962,318	17,671,177	860,547	3,969,930	1,017,969	12,648,272	450,560	*46,935	*142	622,140	*200,982	825,541	17,671,177
July	17,417,910	1,020,263	18,438,173	851,009	3,754,370	885,429	13,028,347	*1,444,728	784,406	29,080	905,994	*193,770	80,982	18,438,173
August	18,604,220	1,090,795	19,695,015	993,232	4,015,520	695,847	13,843,015	185,160	*1,048,850	*85,756	850,896	*48,851	*147,491	19,695,015
Total	127,148,936	8,085,673	135,234,609	7,473,431	29,678,403	5,004,817	100,687,927	2,356,031	4,001,445	*419,189	2,595,451	*923,819	7,609,919	135,234,609

*Added to stocks.



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Oregon and the movement of this commodity during the year to date indicates a larger demand in 1935.

Fuel oil consumption in the State of California has been fairly consistent during the past five years, although depressed conditions in 1932 and 1933 were reflected in a lower demand. In 1931 the total consumption of fuel oil for all commercial purposes was 68,334,000 bbls., but this dropped to 59,141,000 bbls. in 1932 due primarily to a substantially lower consumption by railroads and steamships. Total consumption of fuel oil in 1933 was 60,272,000 bbls., or approximately 1,100,000 bbls. higher than during the preceding year. Railroads used less fuel oil in 1933, but the shipping industry and commercial consumers showed an increased demand. Railroad consumption of fuel oil in 1934, although substantially lower than the demand in 1931, was materially in excess of consumption during the preceding two years. Fuel oil consumption during 1934 by steamships, which has shown a consistent increase for the past three years, was higher than the demand in 1931. This trend is diametrically opposite to the general trend shown by other consumers of fuel oil. A preliminary check indicates that fuel oil consumption in California during 1935 will be substantially higher than during 1934 by practically all consumers with the exception of gas and electric companies.

In State of Washington

Consumption of fuel oil in the State of Washington did not follow the trend characteristic of California and Oregon. Deliveries of fuel oil to steamships in California, which has been consistently increasing during the past few years, shows a fluctuating trend in Washington as deliveries to steamships in 1931 totaled 2,349,000 bbls., but this declined to 1,861,000 bbls. in 1932. During the following year steamships required 2,124,000 bbls. at Washington ports but the demand declined again in 1934 to 1,822,000 bbls. There has been a consistent increase in the consumption of fuel oil on the Pacific Coast since the low point reached in 1932. Total fuel oil consumption in California, Washington, Oregon, Arizona and Nevada totaled 85,603,000 bbls. in 1931, but, reflecting the general depression, consumption of fuel oil in this area decreased to 75,025,000 bbls. in 1933. It showed a gain in 1934, when the demand totaled 80,217,000 bbls. Preliminary figures during the current year to date indicate a further substantial increase.

Intercoastal shipments to the Atlantic seaboard for domestic consumption during 1935 to date are substantially lower than for the same period last year due principally to the elimination of fuel oil shipments. Over 10,000,000 bbls. of fuel oil moved in the intercoastal trade at this time last year whereas not a single tanker has lifted a cargo of fuel oil for the intercoastal trade during 1935 to date. Shipments of Diesel, gas oil and gasoline to the Atlantic seaboard for domestic consumption are also lower than last year. The movement of asphalt on the other hand is substantially in excess of the amount moved in this business last year. As a matter of fact, California marketers have already shipped more asphalt to the East Coast during the year to date than they did during the entire 12 months of last year.

Foreign shipments of crude and refined oil are far in excess of last year. This is especially true of crude oil and gasoline. The demand for gasoline in Pacific Coast territory has shown an excellent recovery in 1935 following a period of ups and downs. There was not much difference between the consumption of gasoline in California, Oregon, Washington and Nevada between 1930 and 1934, although there was a fluctuation during the intervening period. Gasoline sales during 1935 are running ahead of last year but at the same time are not showing the increase that one might anticipate in view of the increased number of eight-cylinder automobiles which as a rule use considerably more gasoline than the six-cylinder cars. Gasoline sales during 1934 as far as volume is concerned were on a par with 1933. For instance, 1,336,535,981 gallons of gasoline were sold in California during the year 1930 and 1,334,233,160 gallons in 1934. In Oregon, sales for the same period were 166,093,315 gallons and 165,978,464 gallons, respectively, and in Washington 271,075,138 gallons and 260,789,652 gallons. Sales in Nevada for the same period were 18,500,839 gallons and 27,154,738 gallons, respectively.

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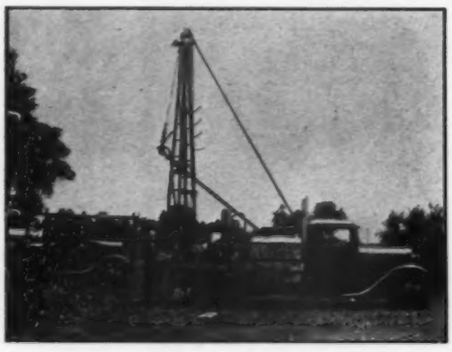
UNION OIL COMPANY

Consistent Gain in Use of Geophysical Methods Shown in California Fields

There has been a consistent increase in geophysical activities in California during the past three years and the scope of work and wider use of this method of exploration has exceeded even the most sanguine expectations. Several gas fields have already been discovered in California as a result of geophysical exploration and positive results in untested areas indicate the probability additional gas fields may be discovered within the next year. It is also reasonable to expect new oil fields may be discovered as a direct result of geophysical exploration. All major companies in California are using geophysical exploration for basic data or to confirm geological reports and the increased scope of work will sooner or later be productive of satisfactory results. Due to the cost involved, California operators have on several occasions conducted joint tests with each company bearing a pro rata share of expenses and participating accordingly in any discoveries made.



Portable drilling rig used in survey

The cost of a geophysical crew with instruments and drills averages $10,000 per month and on this basis California operators spent approximately $100,000 for geophysical work in 1933, about $750,000 in 1934, and by close of 1935 will have expended approximately $1,250,000 during the present year for basic research work. Personnel and equipment of the usual geophysical party as used in California includes the chief of the party, one computer, two drillers, two drillers' helpers, one water man, one shooter, one shooter's helper, one observer, one assistant observer, one observer's helper, two portable drilling rigs, one water truck and one recording truck. These surveys are conducted by both oil company crews and by consulting companies on a contract basis. On surveys conducted by company employes it is usually customary to supplement the geophysical party with a geologist, a surveyor and several linemen at frequent intervals.

Reflection Method Used

Practically all of the geophysical exploration work undertaken in California during 1934 and 1935 has been of the reflection seismograph type. No torsion balances have been operated during the year to date and as far as can be ascertained the last magnetometer survey was made in 1934. During the latter part of last year one short survey was made using the resistivity method, but during 1935 practically all of the geophysical work undertaken in California was confined to the reflection seismograph. Most operators in California were rather dilatory in the general application of the reflection seismograph and it was not until the summer of 1934 that the effectiveness of the reflection method in solving California geological problems was recognized and fully appreciated. In December, 1934, there were 15 reflection seismograph crews operating in the State and by June, 1935, the number had increased to 21. Considering the areal limitations imposed by the amount of potentially productive acreage, this probably represents as great a concentration of reflection activity as can be found anywhere.

Geophysical work in California up to the present has been concentrated more or less exclusively in the San Joaquin Valley, Sacramento Valley, Los Angeles Basin, Ventura Basin and the Santa Maria Valley. During 1934 approximately 80 per cent of all geophysical work undertaken was confined to the San Joaquin Valley area and the balance spread out over the other districts just mentioned. A similar situation has prevailed during 1935, although in contrast with operations during 1934, when work was concentrated in the extreme western part of the San Joaquin Valley, there has been a tendency to move slightly northward and to broaden the scope of work. The reflection seismograph is especially adaptable out on the floor of the San Joaquin Basin because in this area, which is removed from the influence of alluvial fans, the water table is generally found at comparatively shallow depths and excellent reflection records can therefore be obtained. Practically all areas of the State of interest to the petroleum geologist can be effectively surveyed with the reflection seismograph because even though the results obtained in mountainous areas are not especially satisfactory, it is significant to note that as a rule prospectors are not particularly interested in areas containing rocks which would prevent satisfactory work.

Although geophysical work in California up to the present has not been comparable with the results obtained in other areas, it is assumed that with additional experience and aggressive exploration work on the part of operators satisfactory results will become more pronounced within the next year. In California areas where the geologic section contains only one very hard stratum overlain by a comparatively soft formation the problem of correlating reflection records is rather simple. It has been found in a number of cases, however, that the geologic section contains many strata which act as good reflectors of wave energy and the problem of correlating is rendered somewhat difficult. The complexity of the problem obviously increases in proportion to the number of reflecting beds and their degree of uniformity in reflecting efficiency. In several instances sections have been found to contain a large number of equally good reflecting strata, some of which change in character and reflecting efficiency, and in these cases the dip of the reflecting beds has been utilized as an aid to correlation. Areas where reflecting beds have been used for the delineation of subsurface structure of Cretaceous age or earlier include the Sacramento Valley and northern part of the San Joaquin Valley. In most other areas in California the Pliocene and Miocene are used as reflecting horizons, although in a few instances reflecting beds in the Eocene have also responded satisfactorily to the reflection seismograph.

Recording truck on location

T. A. O'Donnell, president, California Petroleum Corp., first president, A.P.I.

Although there seems to be a superabundance of gas fields in California at the present time, the potential gas reserve might not be as large as would appear from a superficial survey. The Semi-Tropic gas field showed such a loss in pressure during the flow test conducted in August, 1935, there is considerable doubt as to the ability of this field to hold up on commercial gas production for more than a relatively limited period. It was the original intention of operators developing this field to drill one well to each 40 acres, but recent developments indicate drilling operations will be limited to one well to not less than 160 acres. The real importance of the Delano, Buena Vista Lake, Tracy, Chowchilla and Goleta gas fields, as far as sustained commercial production is concerned, will be determined only after they are called upon to produce their quota of the State's demand for gas. These areas appear to have a substantial reserve of natural gas, but none has been on commercial gas production for any length of time.

Buttonwillow

The Buttonwillow gas field of Kern County appears to be the most important gas field discovered in California up to the present, although it must be remembered the development of this field has progressed far in excess of any other similar district. Four productive gas zones have been found in the Buttonwillow gas field, although the areal extent of the two more recent zones has not yet been determined. The first zone is known to oper-

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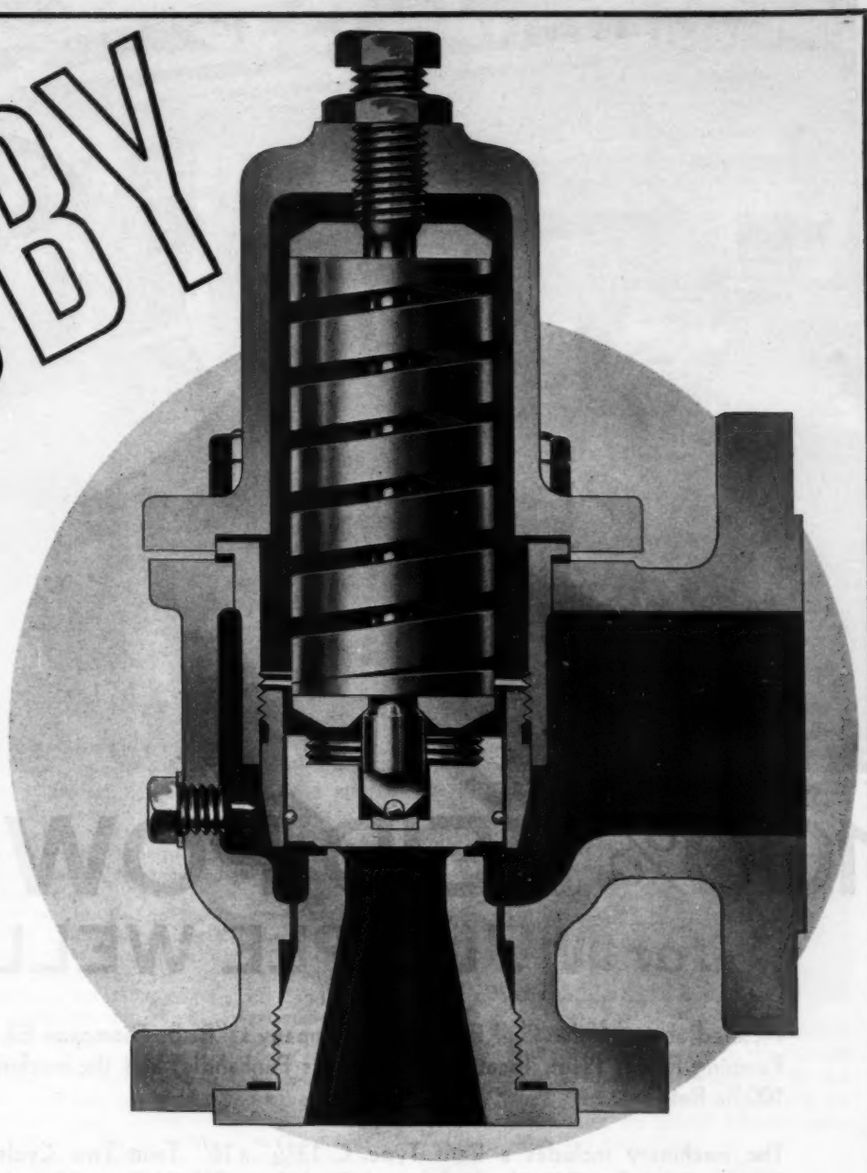

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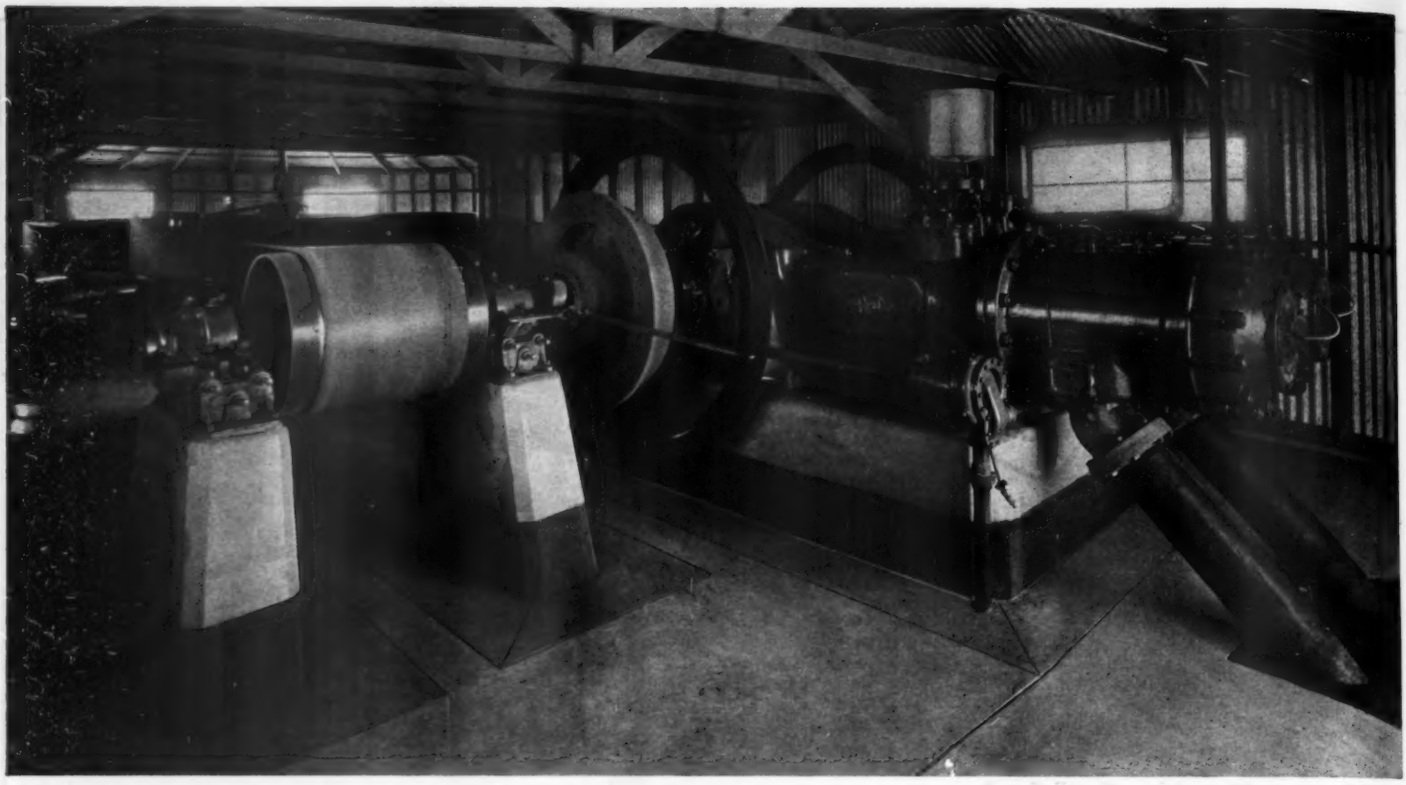

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ators in the field as the sandy Tulare zone, topped at approximately 2,400 feet. The second productive horizon is known as the Contact zone, picked up at approximately 2,500 feet. Within the past 60 days Milham Exploration Co., drilling a well on a contract basis for Arlington Property Corp., completed this well in a new and heretofore unknown horizon. This productive sand is now known as the first Arlington zone and is encountered at approximately 2,750 feet. As a result of deepening operations involving No. 5 K.C.L., Milham Exploration Co. found a new zone at 3,100 feet which has been tentatively designated as the Kern Five zone. In view of the fact that both No. 1 Arlington and No. 5 K.C.L. are located out on the flanks of the structure, it is possible there may not be any uniformity in these zones throughout the field.

The discovery of several additional dry gas fields in California during the past year is especially timely in view of the depletion in existing oil fields and the failure of prospectors to discover new prolific areas, because these new gas fields will be able to replace the diminishing production of oil gas and thus assure the continued use of gas for heating and manufacturing purposes. The Buttonwillow gas field of Kern County has been on a restricted production basis for several months and if the coming winter period proves to be a cold one, we may anticipate increased production from Buttonwillow and the starting of commercial production by other gas fields for the first time. In California there are 427 communities using natural gas and only 14 isolated areas being served with manufactured gas. In 15 other smaller communities butane gas is being utilized.

Consistent Increase

In 1933 there were only three geophysical crews working in California, but before the close of 1934 the number had increased to 15. During 1935 there have been as high as 21 geophysical crews working simultaneously and, at the present rate of increase and results obtained, it would not be surprising if the number exceeded 30 next year. Geophysical exploration has resulted in the discovery of five gas fields in California, the Semi-Tropic, Delano, Tracy, Chowchilla and Buena Vista Lake areas. Pure Oil Co. drilled its first test at Chowchilla as the result of a favorable geophysical report and may have possibly discovered a commercial gas field, as this well came in flowing approximately 12,000,000 feet of dry gas per day from 8,125 feet in April, 1935. Previously it showed a much larger flow but, since the company was not especially interested in dry gas, drilling operations were continued. It is possible, therefore, Chowchilla may be of greater importance than is evident at present. The company has recently started a second test in Section 8-10-14 in this district which should determine the importance of the gas zone found in the first test. The Pure undertook exploration work in the Chowchilla district to determine its potentiality as an oil field. The initial test failed to show any indication of oil but it was not exactly a dud because the company has apparently discovered a substantial accumulation of dry gas which will have a marketable value later. The gas found in the Chowchilla district, approximately 15 miles south of Merced, has a low b.t.u. value and emanates from a sand the top of which is located at a depth of approximately 8,000 feet. Despite the low heat value of the gas, the volume found may permit its being blended with a gas of higher value and this field may ultimately become an important factor in future gas production. Discovery of gas in the Chowchilla area confirms the reflection results and may be considered a successful geophysical discovery despite any unfavorable developments which might occur later.

Semi-Tropic

Although there were some surface indications of the existence of a potential field at Semi-Tropic, of Kern County, a geophysical survey was so positive a well was drilled on seismograph information and the result of drilling confirmed this discovery. Subsequent development indicates the outline of the field, as established by geophysical exploration, closely approximates the limits of the field as determined by actual drilling. Fullerton Oil Co. acquired acreage in the Semi-Tropic gas field three or four years ago and drilled a series of nine core holes, the deepest carried to approximately 2,600

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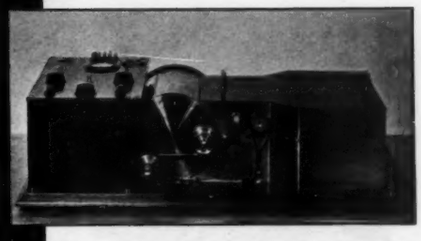

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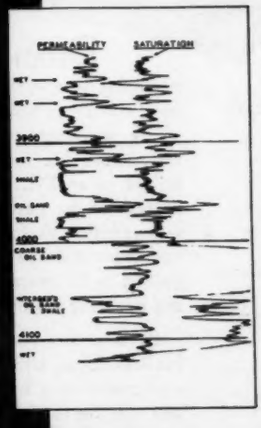

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feet. The company subsequently conducted a geophysical survey which confirmed the evidence of structure indicated by the original structure survey holes. Fullerton Oil Co. acquired considerable acreage but did not undertake immediate drilling. Standard Oil Co. subsequently moved into the Semi-Tropic gas field and after acquiring a substantial block made a geophysical survey which resulted in the drilling of No. 1 Hill in Section 8-27-23. This was the discovery well in the Semi-Tropic gas field, where 20 gas wells have been completed. No. 1 Hill blew in flowing approximately 75,000,000 feet of dry gas per day while the crew was cleaning out the hole preparatory to making a water shut-off test. It caught fire within a short time and destroyed the rig and damaged surface equipment, but sanded up soon after blowing in.

Delano Field

As a result of the success at Semi-Tropic and continued aggressive geophysical exploration, the Standard definitely proved the existence of commercial production in the Trico or Delano gas field of Kern County. This district is in the center of the San Joaquin Valley, about 7 miles west of Delano, in close proximity to the county lines separating Kern, Kings and Tulare Counties, and consequently the productive area may extend into one or more of these counties. The discovery well in the Delano gas field was No. 1 Title Guarantee in Section 1-25-23, brought in flowing 12,500,000 feet of dry gas per day from 2,455 feet. Previous to drilling of Standard's initial test in the Delano gas field, the Trico Oil & Gas Co. had completed one gas well and was proceeding with additional development but without the aid of a geophysical survey the company was drilling more or less in the dark. Trico Oil & Gas Co.'s initial well in the Delano gas field, in Section 3-25-23, was completed flowing approximately 13,000,000 feet of dry gas per day from 2,525 feet. The company's No. 2, 3 and 4 were duds, but No. 5, in Section 3-25-23, showed an initial daily production of 4,500,000 feet per day from 2,467 feet before being shut in. Geophysical charts indicated the existence of a much more extensive field at Semi-Tropic and subsequent drilling has apparently definitely confirmed this preliminary survey.

Tracy Field

Amerada Petroleum Corp. discovered the Tracy gas field in San Joaquin County following an exhaustive geophysical survey, and if the initial daily production of the company's first two wells is any criterion, Amerada has opened a gas field of the first magnitude in an area only 8 miles from the main transmission line of the Pacific Gas & Electric Co. and about 70 miles from the San Francisco Bay region. The proximity of this potential gas field to Oakland and San Francisco is extremely important from an economic standpoint. Amerada's first test in this district, in Section 15-2-5, was carried down as a deep test in search of oil and consequently it remained for the company's No. 2 F.L.D. to reveal the probable existence of a substantial accumulation of dry gas. No. 3 F.L.D., in Section 22-2-5, was completed in October, 1935, flowing 25,000,000 feet per day from 4,087 feet. Geophysical exploration in the Buena Vista Lake district of Kern County, where Ohio Oil Co. has already proved up the probable existence of a substantial accumulation of dry gas, indicated the presence of an extensive structure, but this has not yet been definitely confirmed. The company's discovery well, No. 1 K.C.L. in Section 31-31-26, came in flowing 7,500,000 feet of gas per day from 5,302 feet in July, 1934, after the hole had been plugged back from 7,957 feet. Ohio's second test at Buena Vista Lake was a duster at 5,563 feet and this well, in Section 32-31-26, was accordingly abandoned. A third test, in Section 31-31-26, is under way. The Buena Vista Lake gas field of Kern County is approximately 18 miles southwest of Bakersfield and wells drilled by Ohio Oil Co. are located on an old lake bottom, generally regarded by most geologists as a very unfavorable location. After seismograph reflection work revealed the existence of a structural trap, Ohio undertook exploration work and is believed to have found a gas field of considerable importance.

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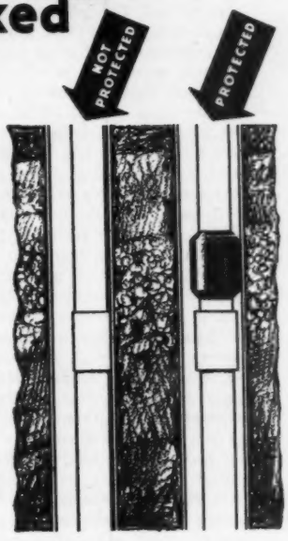

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ASSOCIATED OIL COMPANY

California Field Report

UNION OIL CO.'S DEEP TEST IS AT LAST NEAR COMPLETION

By L. P. STOCKMAN

LOS ANGELES, Calif., Nov. 4.—The Union Oil Co., after a long, hard struggle, has passed the 10,165-foot level in No. 1 Lillis-Welsh, a deep test in the extreme western end of the Kettleman North Dome structure, and although this well will not be completed while the American Petroleum Institute is in session here next week, it may be ready for a production test before the new year. If the company continues to maintain its present average of approximately 25 feet of new hole a day, this well may get a production test before Christmas, and if it results in substantial production, the Union's field department will probably admit there is a Santa Claus after all. This is the first time that the Union has been able to get below the 10,000-foot level due to mechanical trouble which developed during the drilling of the original hole. It is no unusual feat to drill a hole to a depth of 10,000 feet, but it requires a lot of patience, perseverance and excellent drilling ability to take over a hole full of junk and put it in shape to permit deep drilling. No. 1 Lillis-Welsh was lost because of mechanical trouble which developed at a depth of 10,944 feet, but this depth is only of secondary importance as the Union Oil Co. landed a whipstock around 7,000 feet and consequently is now drilling a virgin hole.

The Union's field department, recognizing the potential difficulties with which it is confronted, is proceeding slowly with drilling operations as the exact location of the original hole is unknown and consequently the bit in the present hole may at any time run into the fish which was lost in the first hole at 10,944 feet. This happened several times higher up in the hole and necessitated extra work.

No. 1 Lillis-Welsh is expected to be carried down to approximately 11,000 feet, the exact depth depending upon the condition of the hole from a mechanical standpoint and production possibilities. The Union still has approximately 800 feet to go before reaching a depth comparable with that which showed on the log when the company took possession of the well.

Deep Zone

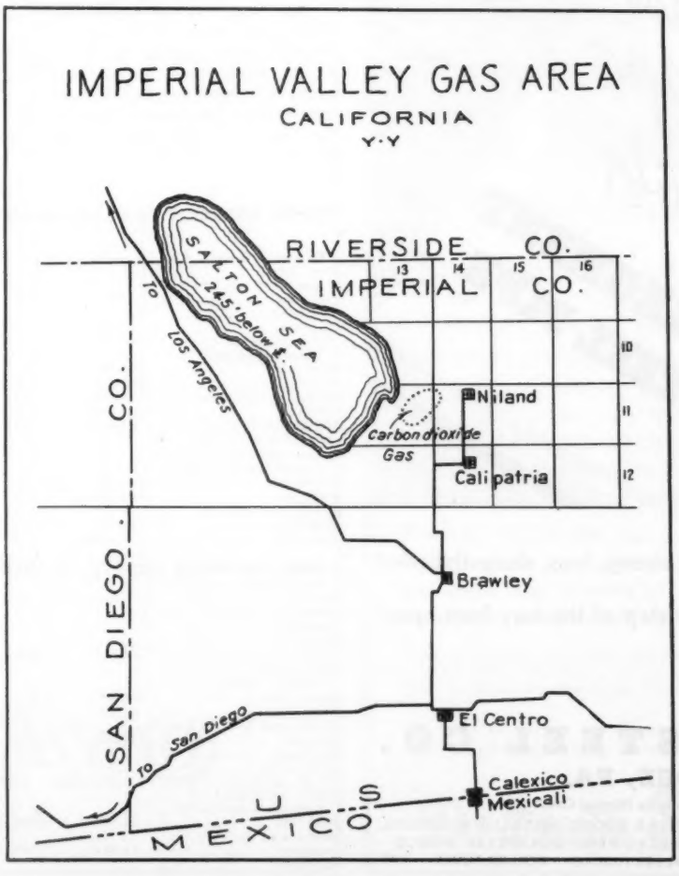
No. 1 Lillis-Welsh is located outside of the blue line which encloses what is believed is the maximum outer limits of production in the Kettleman North Dome Field as far as Temblor production is concerned. The Union is drilling this well in order definitely to determine production possibilities of a zone encountered by Ed McAdams before a premature explosion junked the hole. The exact age and formation in which this showing was found has not been determined definitely and it may be of either Oligocene or Eocene age. The significance which attaches to the drilling of No. 1 Lillis-Welsh lies in the fact that it will increase the present limits of production and prove up the existence of a deeper productive zone in the Kettleman North Dome Field if it results in substantial production.

Although the possible existence of a new deeper productive horizon below the present Temblor in the Kettleman North Dome Field is a matter of conjecture due to the limited amount of data available, it is assumed that formations in this field conform with similar rocks in the North Belridge Field of Kern County. The present productive Temblor in the Kettleman North Dome Field is of Miocene age and as the Wagonwheel zone of Oligocene age has been found productive in the North Belridge Field, it may be found productive in the Kettleman North Dome Field with deeper drilling. The underlying formations of Eocene age may also ultimately be found productive. Development of deep production in the Kettleman North Dome Field would substantially increase the future reserves of the state, especially if these deeper zones were conformable over the entire structure.

Kettleman Hills

The Kettleman North Dome Association successfully completed its No. 62-32-J in the Kettleman North Dome Field and this new well, bottomed at 8,545 feet and finished with a 4¾-inch liner carrying perforations at 8,347-8,409 feet and at 8,477-8,540 feet, was brought in flowing 1,561 bbls. of 34.9 gravity oil and 550,000 feet of gas a day. There are a number of potential producers nearing completion in the field. Both Kenda and the Standard are starting new wells in various sections of the field. The Kettleman North Dome Association either has material on ground or locations staked for No. 27-20-J, No. 47-20-J, No. 87-20-J, No. 43-28-J and No. 85-28-J. The Standard's projected development program includes wells No. 45-19-J, No. 72-19-J and No. 67-29-J. In addition to this group, the Standard has several wells which were either recently spudded in or being prepared for early work.

The Belridge Oil Co. completed an excellent well in the deep Wagonwheel zone of Oligocene age in the North Belridge Field of Kern County when No. 32-35 in Section 35-27-20 was brought in flowing 4,425 bbls. of 32.1 gravity oil and 23,600,000 feet of gas a day from 8,487 feet after the hole had been finished with a 4¾-inch liner including 347 feet of perforated. This new well has a 7-inch water string landed and cemented at 8,128 feet and is producing through 8,048 feet of 3-inch tubing. The company's No. 33-35 in the same section is rotating ahead in oil sand at 7,950 feet, following an effective cement job on the 9-inch landed at 7,802 feet. The Standard Oil Co. has recompleted No. 2 McPhail after plugging back the hole from 8,501 feet to 8,200 feet and this well was returned to production flowing 6,663 bbls. of 39.9 gravity oil and 60,600,000 feet of gas through two 2-inch beans. No. 3 McPhail, which is rotating ahead in brown shale at 7,300 feet, has approximately another 1,000 feet to go before drilling operations are completed. The Union Oil Co. is expected to make a production test on No. 19 Belridge in the immediate future as the 8⅝-inch water string was recently landed and cemented at 7,830 feet. The company resumed drilling operations in this well a few days ago and with normal progress should be on production in the near future. The company's No. 7 Gibson, however, is running so low structurally that it is questionable whether it will result in commercial production. This well is down 8,250 feet and the hole is open for the greater part of this depth as the only pipe landed to date consists of 1,095 feet of 16-inch. The Continental Oil Co. is stepping right along with No. 6 Result, a new well in the North Belridge Field, and unless something unforeseen develops, it should be on production before the close of the current year.



Mountain View

The Hogan Petroleum Co. completed an excellent well in the Mountain View Field of Kern County several days ago and a check of development work under way indicates the probable completion of four additional potential producers in the immediate future. These four wells, scheduled for early completion, are No. 1 Bloemer of the Canal Oil Co. in Section 30-30-29, No. 2 Mullaney of the Gilmore-Snyder Oil Co. in Section 24-30-28, Mohawk Petroleum Co.'s No. 7 Hood in Section 30-30-29 and No. 6 Banton of the Standard Oil Co. in Section 24-30-28, as all are rotating ahead in the pay at the present time. There are other potential producers under way. The Hogan Petroleum Co.'s latest completion in the Mountain View Field was No. 6 Porter-Day in Section 29-30-29, which was brought in flowing 2,160 bbls. of 29.2 gravity oil a day. This new well, bottomed at 5,889 feet, has an 8⅝-inch water string landed at 5,517 feet

and the hole was finished with a 6⅝-inch liner including 228 feet of perforated and 5,280 feet of 2½-inch tubing. This is the second successful completion of the Hogan interests in this field within the past fortnight, as No. 1 Foster in Section 32-30-29 was brought in last week flowing 4,719 bbls. of 30.9 gravity oil a day from 5,971 feet. Several new wells have either already got under way or are scheduled for immediate drilling in the Mountain View Field. These include the Treasure Oil Co.'s No. 1 in Section 12-30-28, Vesta Petroleum Co.'s No. 9 Hopkins in Section 19-30-29, No. 2 Wilson and No. 6 Wible of the Standard Oil Co., No. 2 Wright-Bloemer of O'Kane & Brain Oil Co., No. 2 Bloemer of the Mohawk Petroleum Co., No. 5 Wharton of the Hogan Petroleum Co. and No. 9 Miller of the Hancock Oil Co.

Drilling operations in the Edison Field of Kern County, which have shown a wide fluctuation during the year to date, appear to be increasing again, although operators have not shown any inclination to engage in extensive drilling. The A. T. Jergins Trust, which finished No. 6 fee last week pumping 310 bbls. a day from 1,473 feet, has followed up this successful completion by finishing No. 7 fee pumping 744 bbls. of 21.3 gravity oil a day from 1,386 feet. This new well has an 11¾-inch water string landed and cemented at 936 feet and was finished with an 8⅝-inch liner carrying 410 feet of perforated. This is the best well finished in the Edison Field in several months and it is holding up in good shape. No. 6 fee, finished last week, has built up to 468 bbls. a day on the beam and is producing clean 19.4 gravity oil. The A. T. Jergins Trust has just spudded in No. 8 fee and is building rig for No. 7 McGowan. No. 2 Smithwick in Section 24-30-29 ran into granite at 1,265 feet and an effort is being made to develop production above this point. Rogers & Osborne appeared to have the makings of a producing well in No. 1 Navy at 963 feet, where a good looking oil sand was picked up, but the bit drilled into gray sand at 965 feet and drilling operations were resumed. The Shell Oil Co. is starting two new wells in this field, No. 4 Clare in Section 14-30-29 and No. 4 Duff in Section 15-30-29, and both are expected to get under way within the next 15 days.

Playa Del Rey

The Union Oil Co. chalked up two new completions in the Playa Del Rey Field of Los Angeles Basin during the current week and has staked location for another new well, No. 14 Vidor. The company's No. 13 Vidor, bottomed at 6,071 feet and finished with a 4¾-inch liner including 40 feet of perforated, was brought in flowing 796 bbls. of 22.7 gravity oil and 600,000 feet of gas a day. No. 11 Del Rey, finished earlier, was brought in on gas lift following completion at 6,335 feet and showed an initial daily production of 280 bbls. of 21.8 gravity oil cutting 3 per cent.

Dominguez

The Shell Oil Co. added a new well to its list of producers in the Dominguez Field of Los Angeles Basin a few days ago when No. 68 Reyes was brought in flowing 629 bbls. of 30.6 gravity oil a day from 4,540 feet. This new well has an 8⅝-inch water string landed and cemented at 4,280 feet and was finished with a 5¾-inch liner carrying perforations at 4,288-4,441 feet and at 4,464-4,512 feet. The Union and Shell, which control practically all of the productive acreage in the Dominguez Field, appear to be slowing down development work, as there are only five strings of tools in operation. In the West Coyote Field of Los Angeles Basin, the Standard Oil Co. is reaming No. 124 Murphy-Coyote and will probably have this well tanking oil soon. The company is rigging up rotary drilling equipment on No. 60 Emery preparatory to an early spud and has a rig standing for No. 61.

The Union Oil Co. finished a good well in the Santa Fe Springs of Los Angeles Basin during the early part of the week when No. 91 Bell was brought in pumping 349 bbls. of 32.5 gravity oil a day from 3,746 feet after the hole had been finished with an 6⅝-inch liner carying 62 feet of perforated. The production of this well is considered satisfactory in view of the present depleted condition of the productive measures in the Santa Fe Springs Field. This company, which has been developing its undrilled acreage in the Santa Fe Springs Field, is working on four uncompleted drilling projects. The General Petroleum is expected to complete No. 52 Santa Fe in this field during the forthcoming week, as the hole is being reamed preparatory to completion at 4,650 feet. The Standard Oil Co. finished a commercial producer in the Seal Beach Field of Los Angeles Basin several days ago when No. 26 San Gabriel was brought in on a compressor doing 602 bbls. of 27.6 gravity oil a day from 6,470 feet after the hole had been plugged back from 6,500 feet because of bottom water. The production of this well showed a cut of 10 per cent and it is possible that the company may reenter the hole and dump a little more cement on bottom. The Continental Oil Co. got an effective water shutoff on the 7-inch water string in No. 37 Bixby at 5,812 feet and this well, which is being drilled ahead, should be completed in the near future. The Pacific Coast Oil Co. completed the only new well chalked up in the Long Beach Field of Los Angeles Basin during the current week when its No. 1 Signal was brought in pumping 135 bbls. of 24.2 gravity oil a day. This well was originally the McKeon Oil Co.'s No. 9, abandoned several years ago. The Pacific Coast Oil Co. erected a new rig over the abandoned hole and redrilled it to 4,150 feet and finished it with a 6⅝-inch liner including 35 feet of perforated.

Kern River

Three new wells were completed out on the west front of the old Kern River Field during the present week. The Standard Oil Co. accounted for two of these when Nos. 4 and 5 on fee owned acreage in Section 5-28-27 were brought in on the beam. No. 5 fee, finished at 2,821 feet, showed an initial daily production of 230 bbls. of 15.1 gravity oil while No. 4 fee was brought in pumping 223 bbls. of 15.2 gravity oil a day from 2,625 feet

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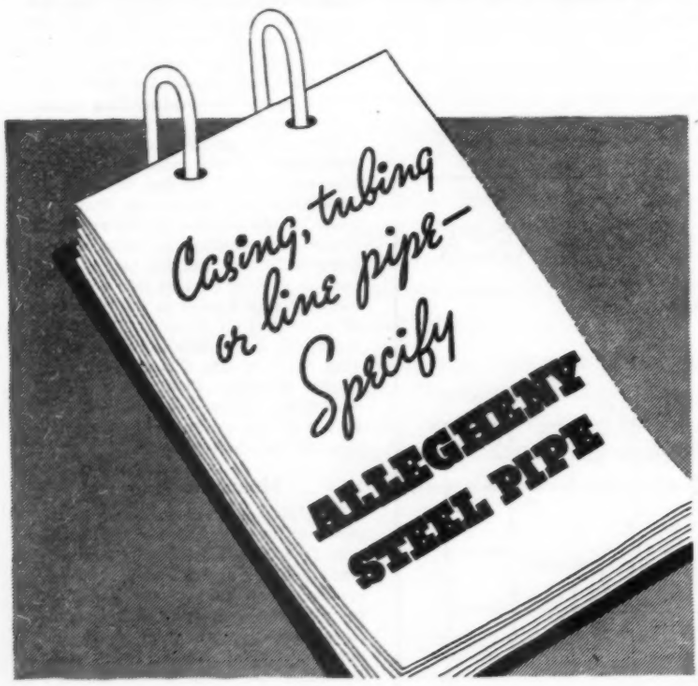

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TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	October 20		October 13			
Intercoastal-domestic:	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Fuel oil	.....	.....	.....	.....	.....	10,670,184
Diesel and gas oil	.....	.....	.....	.....	527,098	1,098,288
Gasoline	.....	.....	223,010	33,287	6,160,890	6,351,401
Kerosene	.....	.....	.....	.....	753,457	878,317
Asphalt	.....	.....	.....	.....	.....	70,019
Other finished oil	.....	.....	.....	.....	.....	54,778
Foreign export:						
Crude oil	302,386	43,341	134,297	19,185	10,727,088	6,280,19!
Fuel oil	250,459	35,780	381,988	54,570	9,942,617	10,529,024
Diesel and gas oil	79,062	11,295	31,021	4,432	3,629,369	3,253,842
Gasoline	284,821	40,689	79,816	11,402	5,522,964	3,723,359
Kerosene	50,699	7,243	.....	.....	1,013,609	1,461,730
Other finished oil	.....	.....	.....	.....	.....	37,955
Other unfinished oil	.....	.....	.....	.....	99,847	224,275
Coastwise-domestic:						
Crude oil	177,145	25,306	376,818	53,831	5,520,535	6,934,565
Fuel oil	149,186	21,312	9,460	1,351	7,676,253	7,841,430
Diesel and gas oil	8,054	1,151	327,181	46,740	1,030,818	587,769
Gasoline	338,183	48,312	56,419	8,060	9,081,358	10,623,933
Kerosene	4,588	655	.....	.....	154,485	124,330

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic:						
Fuel oil	.....	.....	.....	.....	.....	110,650
Diesel and gas oil	.....	.....	.....	.....	158,152	526,288
Gasoline	.....	.....	.....	.....	.....	365,283
Kerosene	.....	.....	.....	.....	149,715	276,412
Asphalt	64,183	9,169	.....	.....	484,597	.....
Lubricants	.....	.....	.....	.....	67,325	46,693
Foreign exports:						
Crude oil	159,429	22,777	.....	.....	2,052,691	1,601,165
Fuel oil	20,168	2,881	44,515	6,359	1,837,572	1,722,052
Diesel and gas oil	.....	.....	48,760	6,966	904,651	1,164,102
Gasoline	108,355	15,479	90,256	12,894	2,483,326	2,596,037
Kerosene	.....	.....	.....	.....	627,396	1,004,660
Lubricants	.....	.....	.....	.....	173,507	160,968
Other finished oil	.....	.....	.....	.....	.....	2,760
Other unfinished oil	.....	.....	.....	.....	.....	5,750
Coastwise-domestic:						
Fuel oil	35,382	5,055	109,394	15,628	5,482,732	4,393,562
Diesel and gas oil	.....	.....	.....	.....	175,932	119,036
Gasoline	18,941	2,706	117,516	16,788	3,504,540	4,413,943
Kerosene	.....	.....	.....	.....	76,785	77,442

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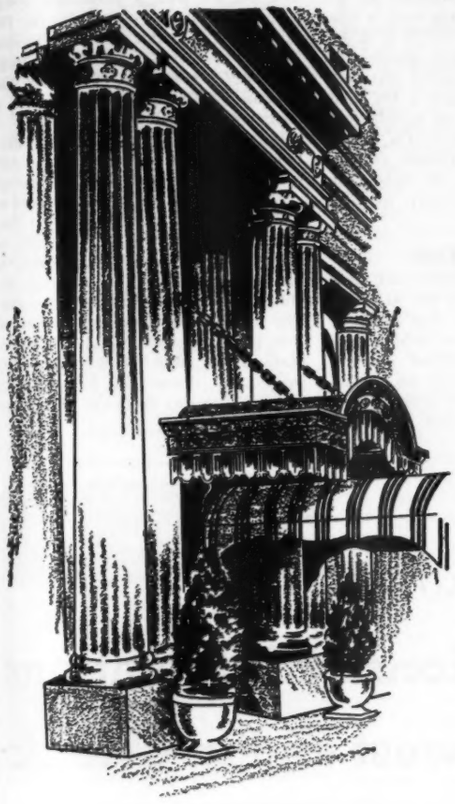

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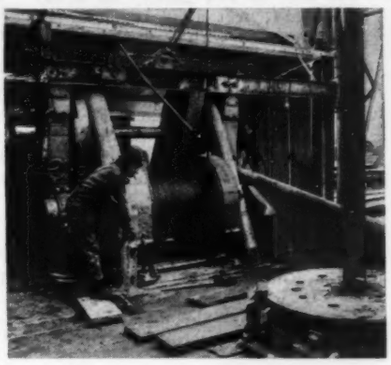

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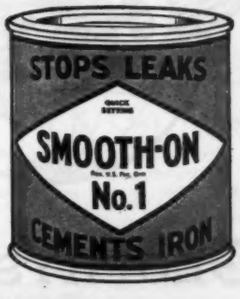

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after a water shutoff had been effected with a string of 8⅝-inch landed and cemented at 2,469 feet. The Standard Oil Co. is starting two new wells on this property and one of these projects should begin making hole within the next week. The Associated Oil Co. completed its No. 5 Premier fee in Section 4-28-27 during the early part of the week pumping 364 bbls. of 15.4 gravity oil a day from 2,847 feet after the hole had been finished with a 6⅝-inch liner including 176 feet of perforated.

Huntington Beach

The Huntington Beach Field of Los Angeles Basin appears to be taking a new lease on life with the result that several new wells are scheduled to get under way within the next few days. The most recent spuds in this field were the Dunlap Oil Co.'s No. 1 Kirk and the Lucky Strike Oil Co.'s No. 5 Huntington, both of which are making hole.

In the Fruitvale Field of Kern County, the Western Gulf Oil Co. completed No. 1 Wear a few days ago and this new well showed an initial daily production of 149 bbls. of 23.1 gravity oil cutting approximately 11 per cent. No. 1 Wear was bottomed at 3,940 feet but plugged back to 3,889 feet before completion.

Semitropic Gas Field

The Fullerton Oil Co., pioneer operator in the Semitropic gas field of Kern County added another gas well to its list in this field when No. 77 in Section 25-27-23 was brought in flowing 1,970,000 feet of dry gas a day from 2,439 feet after the hole had been finished with a 4¾-inch liner carrying 76 feet of perforated. This new well was shut in immediately and the crew was moved over to No. 23 in Section 31-27-24 and preparations were started to begin immediate drilling. Round Mountain Field of Kern County is showing less drilling, but Mount Poso, on the other hand, is registering an increase following a period of indifferent action. The increase in drilling operations in the Mount Poso Field is due to successful extension work on the part of several operators and several additional locations were staked during the current week. The Union Oil Co. added another new producer to its list of completions in this field a few days ago by finishing No. 29 S. & M. pumping 731 bbls. of 16.2 gravity oil a day from 1,857 feet after the hole had been completed with a 6⅝-inch liner carrying 45 feet of perforated. No. 9 Vedder of The Texas Co., No. 5 Mathew and No. 26 Vedder of the Shell Oil Co. and No. 49 Heisen of the General Petroleum Corp. are expected in momentarily.

Tracy Gas Field

The Amerada Petroleum Corp. has officially completed its No. 31-22 in the Tracy gas field of San Joaquin County and this well, the second successful gas well completed in this field by Amerada, showed an initial production of 33,800,000 feet of dry gas a day from 4,060 feet after the hole had been plugged back from 4,133 feet. The company's initial test, No. 1 F. L. D., is drilling ahead at 8,700 feet and will be carried down as a conclusive deep test. The Standard Oil Co. ran a formation tester in No. 1 Bolz, an outpost in the Delano gas field, and this well, located in Tulare County, showed approximately 15,000,000 feet of dry gas. The company, following this, cemented a string of 8⅝-inch at 2,420 feet.

In the Capitan Field, Santa Barbara County, the Shell Oil Co. successfully completed No. 1-9 Covarrubias and this new well, bottomed at 2,713 feet and finished with a 6⅝-inch liner carrying perforations at 2,480-2,576 feet and at 2,645-2,710 feet, was brought in flowing 160 bbls. of clean 43.1 gravity oil a day. The Shell's previous completion on this property was No. 1-7 Covarrubias, which was completed a few weeks ago doing 171 bbls. of 22.8 gravity oil a day from the upper zone at 1,320 feet.

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ontario, Nov. 2.—Crude oil and crude naphtha production from Alberta fields in September totaled 109,143 bbls., the highest since January. This compared with 102,741 bbls. in August. Turner Valley naphtha production increased from 97,706 to 104,063 bbls., but light crude was down from 1,530 to 1,379 bbls. Red Coulee light crude declined from 1,794 to 1,689 bbls., while Wainwright heavy crude increased from 1,711 to 1,776 bbls. In September there was an output of 236 bbls. of heavy crude from the Skiff Field. September figures bring the total Alberta production for the nine months to 941,779 bbls., against 955,232 bbls. same period last year. With the anticipated completion of two wells now drilling in the lime and continued operation of the new Royalite Oil Co. absorption plant in the south end it is possible the 1935 output may exceed the 1934 total of 1,265,940 bbls.

Turner Valley Field

In Section 28-18-2w5, South Turner Valley, British Dominion Oil & Development Corp.'s No. 4, LSD 6, is 380 feet in the Madison lime below 6,210 feet and drilling in very hard formation against a flow of about 7,000,000 feet of wet gas. It is expected to get the main porous horizon of the lime around 6,250 feet. Renfrew Royalties' No. 1, LSD 3, same section, in the top of the lime at 6,020 feet, is waiting for casing. Union-Freehold Oil Corp.'s No. 1, LSD 8, Section 12-18-2w5, is sidetracking less than 450 feet of the old bottom at 5,150 feet and getting close to the Dalhousie sand.

In North Turner Valley, Model Oils' No. 3, LSD 1, Section 22-20-3w5, got the Madison limestone at 5,734 feet and set 6⅝-inch casing 21 feet in the lime. Model's No. 1, LSD 8, same section, got the lime at 5,800 feet, but No. 3 is about 60 feet higher in elevation. Royalite Oil Co.'s No. 27, LSD 4, Section 23-20-3w5, offsetting Model's No. 3 to the east, is resuming after cementing for water shutoff at 405 feet.

A party of officials of the British-American Oil Co. of Toronto, headed by President A. L. Ellsworth, spent some days in Calgary and vicinity and made a survey of present and prospective drilling operations.

Gem Dome Test

In western Saskatchewan, a few miles east of Walsh, Alberta, Gem Dome Oils, Ltd., of Calgary has located No. 1 wildcat in LSD 6, Section 4-10-29w3, a little south of Cummings, Saskatchewan. The area has been reported on by Dr. J. O. G. Sanderson, who states: "Almost every wildcat drilled in this general area has found gas or oil. Shows of oil were found at Many Island Lake and gas at Medicine Hat. At Skiff heavy oil flows to the surface from a sand in the basal Ellis at 3,000 feet. It is reasonable to believe and expect that other pools will be found in this large region and that oil will be found in commercial quantities." Gem Dome's No. 1 is expected to spud this fall.

Hudson Bay Junction

In the Hudson Bay Junction area, northern Saskatchewan, work is being started on Amalgamated Oils' No. 8 in Township 42-4w2, as a test of the Silurian formation at around 1,200 feet.

drill stem
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Among Gulf Coast Drilling Contractors

C. & C. Drilling Co. is moving in rig for a wildcat test in San Jacinto County to be drilled jointly with Cockburn Oil Corp. Location is in the north 40 acres of a 200-acre tract in the W. Hayes Survey. It is to be drilled to 5,000 feet or 300 feet in the Cockfield sand. In the same county another location is being made by the company for No. 1 Evil Cruze in the H.&T.C. Survey, which will also be drilled to the Cockfield sand. At Pine Island, northern Louisiana, in Caddo Parish, plans are being made to move a rig to location, made by Dick Schwab.

Rutherford Drilling Co. completed No. 7 Seabury in the Samfordyce Field, Hidalgo County, for Skelly Oil Co. and has three rigs running for the company at the Bay City Field, in Matagorda County, two of which are preparing to test two separate sands.

L. W. Capps cemented 16-inch casing at 250 feet on J. K. Lewis and others' wildcat in Jefferson Davis Parish, Louisiana, and is drilling below 4,600 feet on Crown Central Oil Co.'s No. 1 Wilson in the Port Lavaca Field in Calhoun County.

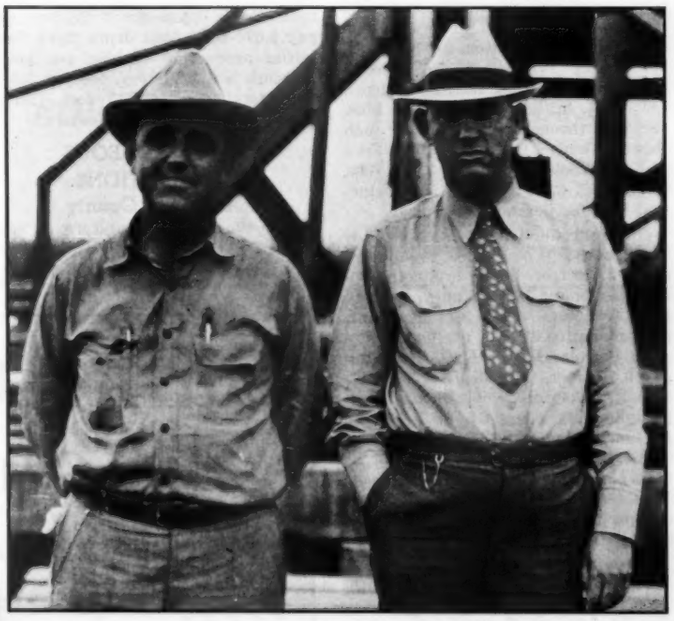
Anderson, Kerr & DeArman are drilling one of the most watched wildcats on the Gulf Coast at Cockburn Oil Corp.'s No. 1 Hine, east of Houston in the A. McCormick Survey. Based on geological markers, it is reported to be running over 200 feet high and has a good chance of being in the money.

Edwards Drilling Co. has rigged up for No. 1 Marshall on the west side of the Anahuac Field in Section 55, H.&T.C. Survey. It is being drilled for the Domestic Exploration Co. and will be the first test to be drilled on the west side of the field. The company has two more rigs in Louisiana and one at the South Houston Field for Stanolind Oil & Gas Co.

J. E. Hooper is moving in a rig for himself, northwest of Cole Springs in San Jacinto County. It is a wildcat and will be known as No. 1 R. B. Love Estate. At the Sheldon Prospect, Harris County, he has the rig up for No. 1-A Swilley and is building roadway for No. 1-B, both of which will be drilled for A. C. Hill. Two other rigs are at Coletto Creek and Placedo Fields, Victoria County.

Cron & Gracey have completed a producer for British American Oil Co. in the East Texas Field and have seven other rigs as follows: One at Nash Dome, one at Barbers Hill, two at South Houston, one at Mauritz, one at Placedo and one at Eunice, N. Mex.

Smith & McDannald have missed the expected pay horizon in their No. 1 Mauritz at the Mauritz Field, Jackson County, and are drilling below 5,800 feet. They have completed one well for Stanolind Oil & Gas Co. at the Hastings Field and the rig is being moved to South Houston for the same company. The company has nine other active rigs located as follows: One at the Mauritz Field for Texas Pacific Coal & Oil Co., one at St. Martinsville in Louisiana for Tide Water Oil Co., one at Big Hill for Stanolind Oil & Gas Co., two at South Houston for Stanolind Oil & Gas Co., one for the same company at Hastings, one at Louise for Pure Oil Co., one at Long Lake for Tide Water Oil Co. and one for the same company in the East Texas Field.



Earl Hesser, tool pusher, and Charlie Rowan, of Rowan Drilling Co., on "location" in the Cotton Lake area, southern Chambers County, where the company is drilling Salt Dome-Gem Oil Co.'s No. 1 Lawrence, one of the most attractive wildcats ever drilled on the Gulf Coast. The well is over a half mile out in the marshes and is accessible only by a special board roadway that took considerable time to construct before material could be transported

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Completions in East Texas; Freestone County Test Dry

DALLAS, Tex., Nov. 4. — Completions in the East Texas district were as follows:

EAST TEXAS COMPLETIONS

Gregg County

Arkansas Fuel's No. 8 Calvin, top sand 3,566 feet, total depth 3,591 feet, initial production 26 bbls. in 15 minutes; No. 8 A. E. Lee, top sand 3,605 feet, total depth 3,621 feet, initial production 17 bbls. in 15 minutes; No. 7 L. Y. Tuttle, top sand 3,579 feet, total depth 3,605 feet, initial production 20 bbls. in 15 minutes. Atlantic's No. 65 Hays, top sand 3,508-58 feet, total depth 3,561 feet in shale, initial production 133 bbls. per hour; No. 67 Hays, top sand 3,510 feet, total depth 3,552 feet, initial production 120 bbls. per hour.

Atlantic-Stanolind's No. 14 F. C. Fishburn, top sand 3,489 feet, total depth 3,523 feet, initial production 130 bbls. per hour; No. 17 F. C. Fishburn, top sand 3,489 feet, total depth 3,521 feet, initial production 130 bbls. per hour. Ray Bumpas No. 2 Bumpas, top sand 3,640 feet, total depth 3,648 feet, initial production 50 bbls. per hour. Burke Royalty Co.'s No. 1 T.&P., top sand 3,567 feet, total depth 3,582 feet, initial production 50 bbls. in 30 minutes. Genroe Drilling Co.'s No. 2 Red Bird, top sand 3,578 feet, total depth 3,587 feet, initial production 67 bbls. in two hours, 2-inch tubing.

Humble Oil & Refining Co.'s No. 11 H. Castleberry, top Georgetown lime 3,465 feet, total depth 3,532 feet in lime, dry and abandoned. T. D. Humphrey's No. 6 Branson, top sand 3,585 feet, total depth 3,594 feet, initial production 20 bbls. in 15 minutes. Magnolia Petroleum Co.'s No. 9 Caddie Fisher, top sand 3,425 feet, total depth 3,438 feet in sandy shale, initial production 60 bbls. per hour. Midas Oil Co.'s No. 2 J. S. McCary, top sand 3,470 feet, total depth 3,480 feet, initial production 45 bbls. in 30 minutes.

Shell Petroleum Co.'s No. 32 J. Moore, top sand 3,551 feet, total depth 3,567 feet, initial production 40 bbls. in 30 minutes; No. 35 J. Moore, top pay 3,556 feet, total depth 3,563 feet, initial production 60 bbls. per hour. E. L. Smith's No. 3 Cabinas, top pay 3,616 feet, total depth 3,617 feet, initial production 20 bbls. per hour pumping. Stanolind Oil & Gas Co.'s No. 11 Calvin, top pay 3,561 feet, total depth 3,628 feet, initial production 13 bbls. in 15 minutes; No. 9 Snoddy, top pay 3,584 feet, total depth 3,632 feet, initial production 20 bbls. in 15 minutes. Sun Oil Co.'s No. 20-A Aiken, top pay 3,555 feet, total depth 3,624 feet, initial production 50 bbls. per hour.

Tide Water Oil Co.'s No. 16 Davis, top pay 3,550 feet, total depth 3,586 feet, initial production 15 bbls. in 20 minutes. American Liberty Oil Co.'s No. 18 Sabine River Bed, top pay 3,455 feet, total depth 3,477 feet, initial production 30 bbls. in 30 minutes. Arkansas Fuel Oil Co.'s No. 25 Hughey-Ross, top pay 3,583 feet, total depth 3,608 feet, initial production 19 bbls. in 15 minutes. Simmons' No. 2 Pyles, top pay 3,542 feet, total depth 2,570 feet, initial production 40 bbls. per hour. Empire Gas & Fuel Co.'s No. 9 Lockhart, top pay 3,628 feet, total depth 3,632 feet, initial production 14 bbls. in 15 minutes. Massey's No. 4 Loughridge, top pay 3,702 feet, total depth 3,703 feet, initial production 47 bbls. in 30 minutes.

Rusk County

Gulf Production Co.'s No. 9 Baton, top pay 3,564 feet, total depth 3,624 feet, initial production 20 bbls. per day pumping. Sinclair Prairie Oil Co.'s No. 12-B Kennedy, top pay 3,649 feet, total depth 3,701 feet, initial production 20 bbls. in two hours pumping. Southern-Thurman's No. 6 Alking, top pay 3,712 feet, total depth 3,713 feet, initial production 20 bbls. in 15 minutes. Wilder and others' No. 3 Reddic, top pay 3,618 feet, total depth 3,690 feet, initial production 15 bbls. in 20 minutes.

Arkansas Fuel Oil Co.'s No. 9 Ferguson, top pay 3,635 feet, total depth 3,660 feet, initial production 28 bbls. in 15 minutes. Barbare & Seip's No. 1 Lambert, top pay 3,541 feet, total depth 3,570 feet, initial production 65 bbls. per day swabbing. Champlin & Bass' No. 5 Mason, top pay 3,646 feet, total depth 3,660 feet, initial production 20 bbls. in 15 minutes. Dearing's No. 5 Shaw, top pay 3,692 feet, total depth 3,697 feet, initial production 46 bbls. per hour through three-quarters inch choke. Everetts Drilling Co.'s No. 3 Overton, top pay 3,634 feet, total depth 3,635 feet, initial production 20 bbls. per day pumping.

Forbes & Clarkson's No. 1 Cone, top pay 3,655 feet, total depth 3,656 feet, initial production 30 bbls. per hour. Gant and others' No. 8 Moore, top pay 3,542 feet, total depth 3,600 feet, initial production 34 bbls. per hour. Gulf Production Co.'s No. 5 Shaw, top pay 3,692 feet, total depth 3,697 feet, initial production 46 bbls. per hour through three-quarters inch choke. Humble Oil & Refining Co.'s No. 11 Wooley, top pay 3,664 feet, total depth 3,739 feet, initial production 80 bbls. per hour.

Hunt Production Co.'s No. 14-B Bradford, top pay 3,580 feet, total depth 3,670 feet, initial production 23 bbls. per hour; No. 7 Finney, top pay 3,655 feet, total depth 3,718 feet, initial production 21 bbls. per hour. Magnolia Petroleum Co.'s No. 1 Holt, top pay 3,511 feet, total depth 3,532 feet, initial production 20 bbls. in six hours pumping. Marathon Oil Co.'s No. 17 DeGuerin, top pay 3,614 feet, total depth 3,674 feet, initial production 72 bbls. per hour; No. 21 Price, top pay 3,584 feet, total depth 3,644 feet, initial production 7 bbls. in 15 minutes through one-half inch choke.

Sinclair Prairie Oil Co.'s No. 1 Arnold, top pay 3,671 feet, total depth 3,695 feet, initial production 1,700,000 feet gas. Stanolind Oil & Gas Co.'s No. 12 Alford, top pay 3,823 feet, total depth 3,828 feet, initial production 60 bbls. per hour; No. 5 Wooley, top pay 3,514 feet, total depth 3,560 feet, initial production 50 bbls. in four hours swabbing. Sun Oil Co.'s No. 1 Spence, dry and abandoned 3,728 feet, top sand 3,693-94 feet. Texas Co.'s No. 5 Stubblefield, top pay 3,638 feet, total depth 3,641 feet, initial production 20 bbls. per hour. Texas Canadian Oil Co.'s No. 1-A Cooper, top pay 3,523 feet, total depth 3,673 feet, initial production 6 bbls. per hour pumping.

Smith County

Illinois Oil Co.'s No. 23 Mayfield, top pay 3,820 feet, total depth 3,822 feet, initial production 60 bbls. per hour. Sells Petroleum Co.'s No. 7 Wilson, top pay 3,770 feet, total depth 3,771 feet, initial production 30 bbls. in 20 minutes. Sinclair Prairie Oil Co.'s No. 12 Wiley, top pay 3,830 feet, total depth 3,831 feet, initial production 20 bbls. in three hours swabbing; No. 13 Wiley, top pay 3,828 feet, total depth 3,829 feet, initial production 15 bbls. in 15 minutes. Texas Canadian Oil Co.'s No. 2 Pace, top pay 3,863 feet, total depth 3,864 feet, initial production 20 bbls. in 25 minutes.

Upshur County

Barnett's No. 7 Buckholt, top pay 3,749 feet, total depth 3,754 feet, initial production 40 bbls. per hour through 1-inch choke. Coates' No. 4 Williams, top pay 3,618 feet, total depth 3,626 feet, initial production 50 bbls. in 30 minutes. Conservative Oil Co.'s No. 11 Mackey, top pay 3,688 feet, total depth 3,690 feet, initial production 20 bbls. in 45 minutes. Humble Oil & Refining Co.'s No. 31 Edwards, top pay 3,622 feet, total depth 3,656 feet, initial production 60 bbls. per hour. Lyons and others' No. 4 O'Byrne, top pay 3,745 feet, total depth 3,758 feet, initial production 50 bbls. per hour. Sikes' No. 4 Moyer, top pay 3,580 feet, total depth 3,618 feet, initial production 100 bbls. per hour.

Stanolind and Falcon Oil Co.'s No. 2 Cloud, top pay 3,681 feet, total depth 3,695 feet, initial production 20 bbls. in 18 minutes; No. 2-B Williams, top pay 3,657 feet, total depth 3,665 feet, initial production 20 bbls. in 20 minutes; No. 4-B Williams, top pay 3,692 feet, total depth 3,701 feet, initial production 20 bbls. in 20 minutes. Texas Co.'s No. 5 Taylor, top pay 3,676 feet, total depth 3,688 feet, initial production 45 bbls. per hour. Wilson's No. 1 Victory, top pay 3,632 feet, total depth 3,635 feet, initial production 40 bbls. per hour.

MISCELLANEOUS COMPLETIONS

Anderson County

Tide Water Oil Co. and Texas Seaboard Oil Co.'s No. 2 Shaw & Cern, total depth 5,345 feet, initial production 20 bbls. in three hours through three-quarters inch choke. Westbrook Oil Co.'s No. 1 Wathen, total depth 4,054 feet, initial production 139 bbls. in 24 hours through one-eighth inch choke.

Freestone County

Hoover and others' No. 1 McFall, dry and abandoned 3,612 feet, elevation 451 feet.

Henderson County

Roeser & Pendleton's No. 1-A Murchison, total depth 4,042 feet, initial production 20 bbls. per day, 20 per cent salt water, oil tested 18 degrees gravity, elevation 268 feet.

Van Zandt County

Humble Oil & Refining Co.'s No. 9 York, total depth 2,970 feet, initial production 18 bbls. in 12 hours swabbing.

Colonel Rockwell Says Million to Be Spent

Col. Willard F. Rockwell, president of the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., the Merco Nordstrom Valve Co. of Oakland, Calif., and the Timken Companies of Detroit, Mich., has completed a trip from coast to coast, visiting the various plants operating under his direction. Because of the widely diversified markets for the products and equipment manufactured by these companies, he obtains a broad outlook on industry as a whole. His optimism over present business conditions is shown by his announcement that expenditures in the various plants he heads have been authorized to the extent of over a million dollars.

The rapidly expanding export business of these several companies has necessitated Colonel Rockwell's visit to South and Central America at this time. His return to the United States, via the Pacific Coast was planned to enable him to attend the convention at Los Angeles.

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TEST POINTS TO PRODUCER ON SHEPHERDS MOTT DOME

By
F. L. SINGLETON

HOUSTON, Tex., Nov. 4.—Favorable indications given by a test on the west flank of the Shepherds Mott Dome, southeastern Matagorda County, which may open up the first commercial production, and announcement of an important wildcat location for the Turtle Bay prospect, northern Chambers County, were in the news of the Gulf Coast the past week.

The Shepherds Mott Dome test well, H. M. Smith's No. 1 Wadsworth, in the S. R. Fisher Survey, offered commercial possibilities when it was washed in from a screen setting bottomed in the Frio sand at a total depth of 8,853 feet, and flowed oil, gas and wash water for 20 minutes and then went dead. It then was rigged up to swab and the fluid was lowered 3,000 feet off bottom. On the last four swabs it showed oil and water which carried a salty taste, and it is now shut down for orders. As the hole showed considerable pressure while the tubing was being run, it is believed to have sanded up and it may be several days before another test is made. It is not known just how much sand was taken in. However, in making the screen setting 207 feet of 4½-inch O. D. screen was used.

Approximately 20 wells have been drilled on the dome, but a thick section of heaving shale that overlies the dome has prevented other tests from reaching the prospective pay horizon. The No. 1 Wadsworth was started over a year ago and it reached its present depth after being plugged back and sidetracked several times. The showing has attracted much attention to Helmerich & Payne's No. 1 Hawkins, located to the east and farther up on the dome in the D. McCarthy Survey. It is drilling in shale below 6,300 feet and is reported to have encountered geological markers higher than the Wadsworth test.

The test on the Turtle Bay prospect, at the extreme north end of Galveston (Trinity) Bay in northern Chambers County, is being drilled by Stanolind Oil & Gas Co. on the A. D. Middleton 120-acre tract in the Shadrack Burney Survey. It is 426 feet from the west line and 466 feet from the south line of the tract.

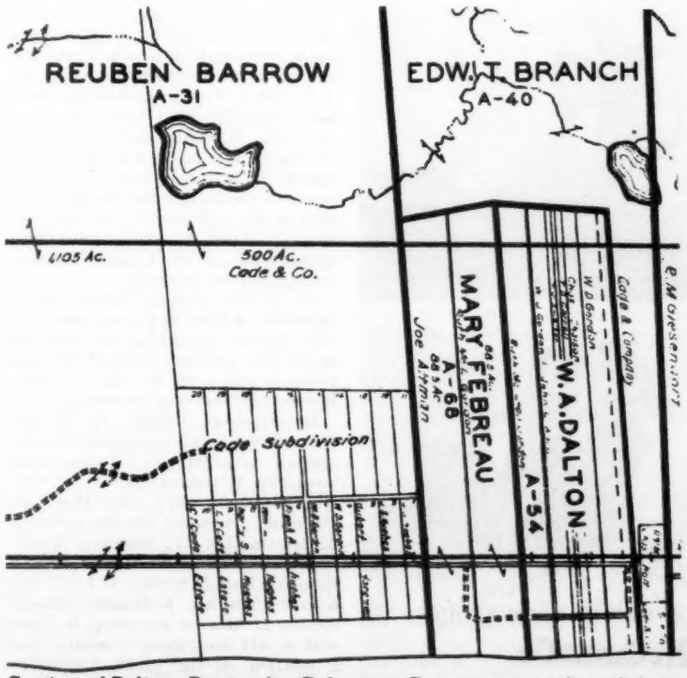
This prospect, most of which extends out into the bay has been thoroughly checked with geophysical instruments and is looked upon as one of the most propitious areas on the Gulf Coast. The company practically controls all of the land in the bay, estimated at approximately 3,000 acres, all of the leases in the Shadrack Burney and M. A. Carroll Surveys and other small adjoining tracts. The location is only a short distance inland from the bay shore.

Leasing and Wildcatting

The increasing leasing and wildcatting play that is taking place along the inland bays and coast line, is one of the interesting developments in the district. The Stanolind location is the fourth made within the past few weeks. The most advanced test is Salt Dome-Gem Oil Co.'s No. 1 A. B. Lawrence, southwest of Stanolind's location in the Cotton Lake area. It topped the Discorbis at 5,984 feet and is drilling in shale below 6,545 feet. Some are of the opinion that the test is normal while others place it as high. However, as there is little control in the area, one guess is good as another at this time. The latest prospect developed is the Bolivar Peninsula area, southeastern Galveston County, where approximately 10,000 acres have been blocked up, most of it owned by the Sun Oil Co. and the Gulf Production Co. The acreage centers in the A. Dickinson, R. Barrow and the A. T. Branch Surveys, and is bordered on the north by the east bay and on the south by the Gulf of Mexico. Two other prospects near the Gulf are the Greens Lake area, southwestern Galveston County, where Sun Oil Co. is preparing to spud No. 1 Hughes, and the McFaddin Beach area, Jefferson County, where Humble Oil & Refining Co. is drilling a deep test only 366 feet from the Gulf.

Humble's No. 6 Engels extended the Anahuac Field 1,000 feet northeast when it flowed 25 bbls. an hour through a one-quarter inch choke with tubing pressure 1,250 pounds and casing pressure 2,000 pounds. Production is from sand topped at 6,853 feet and bottomed at 7,085 feet. The company recorded two other completions. No. 5 Broussard, Section 63, flowed 26 bbls. an hour through a one-quarter inch choke from sand bottomed at 7,081 feet and No. 5 Clark in Section 57, made 18 bbls. an hour through the same size choke from a depth of 7,085 feet. The sand was topped at 7,040 feet. In the north extension area, Sun's No. 3 White is bottomed in oil sand at 7,084 feet with 7-inch casing cemented at 7,040 feet.

The Mauritz Field, Jackson County, recently discovered by Shell Petroleum Corp., was given a "black eye" the past week when two wells failed to pick up the sand encountered in the discovery well and are now drilling deeper. Northeast of the discovery well in the J. Cummings Survey, Smith & McDannald's No. 1 Mauritz is coring in shale below 6,100 feet with no shows of oil or gas being reported. The oil sand in the discovery well was topped at 5,634 feet. Offsetting the discovery to the west, Shell Petroleum Corp.'s No. 1-A Mauritz in the A. Kountze Survey is coring in shaly sand and has failed to pick up any shows. While the appearance of the field's future may be changed when Texas Pacific Coal & Oil Co.'s No. 1 Rosborough reaches the pay horizon, the outlook at this time is not promising. There is no uniform sand condition and the field has the appearance of being similar to the Vanderbilt Pool, located to the southwest, although the discovery well of the Mauritz Field is a much better well than that of Vanderbilt.



Section of Bolivar Peninsula, Galveston County, scene of much leasing and geophysical work

(Map courtesy of W. W. Zingery, Esperson Building, Houston, Tex.)

Green Lake Prospect

At the Green Lake prospect, northwestern part of Calhoun County, Humble is moving in material for No. 1 Mrs. Eliza Welder, located 5,685 feet south, 55 degrees west from a point of intersection of St.L.B.&W. R.R. Survey, and northwest line of the Jose Maria Rios Survey, and 7,210 feet south, 35 degrees east, at right angles in the Gardner Smith Survey. It is north of San Antonio Bay and is an area on which the Texas Co. drilled two dry holes some time ago. It has been worked with geophysical instruments and the company holds several thousand acres under lease.

Approximately one-half mile west of the discovery well on the South Houston Field, Harris County, interest is centered on Diadem Oil Co.'s No. 1 A. C. Dean, located in Lot 152, Block 6, Mary Nichols Survey which is reported to have cored broken sand with oil shows from 3,945-74 feet and from 4,049-55 feet. It is bottomed at 4,060 feet in shale and is preparing to make another drill stem test after three previous tests failed. It is thought to be bottomed in the Miocene sand from which two wells in the field have been completed. In District 17, the discovery well of the field which was drilled deeper is bottomed at 5,629 feet, with 7-inch casing cemented at 4,885 feet.

One completion and three locations were recorded for the Hastings Field, northeastern Brazoria County, all being made by Stanolind Oil & Gas Co. Its No. 1 William J. Miller, A.C.H.&B. Survey No. 2, was washed in from a total depth of 6,080 feet and flowed 645 bbls. in 24 hours through a one-quarter inch choke with tubing pressure 900 pounds and casing pressure 875 pounds. Locations were made for No. 4 Drake in H.T.&B. Survey No. 36, No. 3 Pennock and No. 2 Shaw, both in the same survey.

A production test is scheduled to be made this week on Humble Oil & Refining Co.'s No. 1 Anderson, bottomed in the 9,100-foot sand at the Dickinson Field, Galveston County. The total depth of the hole is 9,121 feet with 7-inch casing cemented at 9,121 feet. The company's No. 2 E. E. Townes, located 933 feet east of No. 1, in the B.B.B.&C. Survey, is also due for completion. Sand and shale showing oil was cored from 8,004-54 feet and is bottomed at 8,065 feet with 7-inch casing cemented at 8,030 feet.

Barnsdall Oil Co.'s No. 1 Smith extended the Placedo Field, Victoria

County, to the south when it was brought in for an initial production of 176 bbls. in 24 hours through a one-eighth inch choke, with tubing pressure 400 pounds and casing pressure 490 pounds. Seven-inch casing was cemented at 4,772 feet with the hole bottomed at 4,778 feet. In the S.A.&M.G. Survey, Smith and Gulf Production Co.'s No. 1 Boehn was completed in the 4,700-foot sand for an initial production of 300 bbls. in 24 hours with tubing pressure 375 pounds and casing pressure 200 pounds. Seven-inch casing was cemented at 4,755 feet. Sun Oil Co.'s No. 2 Marek in the S.A.&M.G. Survey No. 382 flowed 18 bbls. an hour from a total depth of 4,773 feet with casing pressure 550 pounds and tubing pressure 450 pounds. The field's first blowout occurred at Westgate Oil Co.'s No. 1 Henderson and Pickering in Lot 76, S.A.&M.G. Survey, that blew in and caught fire while it was being prepared for completion at a total depth of 4,778 feet. After a dismal start, several good wells are being completed each week, and Placedo may prove much better than first expected.

Coastal Louisiana

Announcement of another interesting wildcat location for the Church Point prospect in Acadia Parish and discovery of two new producing horizons at the Gillis Field, Calcasieu Parish, and the Choctaw Field in Iberville Parish were developments in Coastal Louisiana.

At the Church Point prospect, northern Acadia Parish, Superior Oil Producing Co. is moving in material for No. 1 Adams Smith, situated 334 feet south, 35 degrees, 35 minutes east from the northeast corner of a 38.93-acre tract, thence 473 feet south, 54 degrees, 25 minutes west at right angles in Section 47-7s-1e. It is to be a deep test and is north of two deep dry holes drilled several months ago.

At the Gillis Field (English Bayou) Calcasieu Parish, Union Sulphur Co.'s No. 3 Castle, Section 14-9s-8w, on the northwest edge of the field, was completed in a shallow sand bottomed at 5,182 feet and topped at 5,172 feet, for an initial production of 24 bbls. of fluid an hour through an 18.64-inch choke with tubing pressure 1,850 pounds. A shakeout test showed 7 per cent salt water. It is the shallowest producer completed in the area, which has two productive sands at approximately 6,700 and 7,000 feet.

Standard Oil Co.'s No. 5 Gay, an old well which was drilled deeper, and located in Section 52-9s-11e, of the Choctaw Field, Iberville Parish, topped a new sand at 5,409 feet and was completed at 5,423 feet for an initial production of 350 bbls. of pipe line oil daily through a three-eighths inch choke with tubing pressure 325 pounds and casing pressure 325 pounds. The flow was based on the first two-hour gauge. This well originally was completed in the 4,500-foot sand, and it opens the deepest sand for the field. Other wells have been completed at 2,800 and 4,100-foot levels.

Tide Water Oil Co.'s No. 1 Smedes on the St. Martinsville prospect in southern St. Martin Parish looms as a possible pool opener, following an electrical coring test which showed sand from 5,502-42 feet with from 25 to 12 ohms. It is bottomed at 5,542 feet and 7-inch casing probably will be run to test. It is on a 4,000-acre block that has been worked with geophysical instruments.

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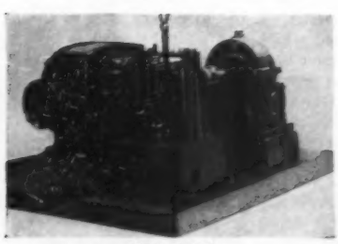

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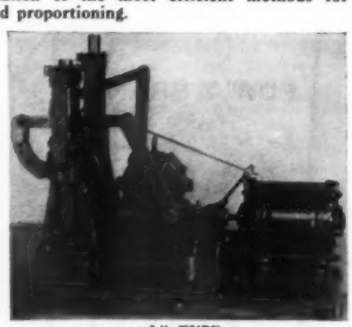

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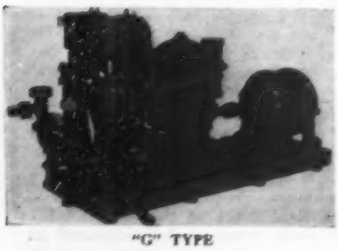

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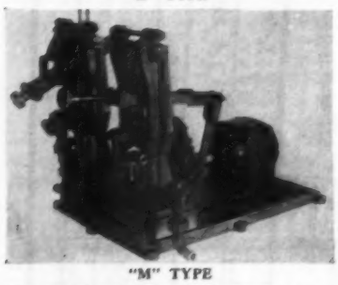

"M" TYPE

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H.L. McCANNA CO.

2345 Nelson St., CHICAGO, ILL.

Manufacturers of Force Feed Lubricators—Saunders Patent Valves — Chemical Proportioning Pumps — Thermometer Wells—Tank Car Outlet Valves—Non-Ferrous Alloys.

Central West

Operations in Central Ohio, Kentucky, Illinois, Indiana

By GEORGE A. WHITNEY

FINDLAY, Ohio, Nov. 4.—In Allen County, Lima Field, Pease & Pease, trustees' No. 4, Steve Zelno, Section 14, Bath Township, produced an initial of 10 bbls. Same parties are starting No. 7, Nancy E. Leedy farm, same section. Carmon Oil Co. is drilling No. 5 Martha Powell, Section 13. C. A. and F. J. Peavey are drilling No. 4 Mary E. Stelle, Section 24.

In Ashland County, Hulse & Tedlow's No. 1 W. F. Landis, Section 11, was dry.

In Stark County, East Ohio Gas Co.'s No. 1 G. and E. Whetstone, Section 13, Jackson Township, is a gas well in the Clinton lime at 4,423 feet. Same company is shut down at 300 feet in No. 4 Howard Fawcett, Section 17. Same company is reported at 4,165 feet in No. 1 J. and E. Holtzbach, Section 4. White & Lyons are fishing at 18 feet in the sand on No. 1 J. and L. Deetz, Section 21, Jackson Township. East Ohio Gas Co.'s No. 1 M. D. Smith, Section 3, Plain Township, is a gas well in the Clinton lime at 4,576 feet. In Perry Township, Lyons & Co. is drilling around 4,250 feet in No. 1 Homer E. Snyder, Section 11. Wiser Oil Co. is shut down at 3,100 feet in No. 1 Ralph Shaffer, Section 5, Pike Township.

In Lorain County, Frank Meredith's No. 1 Rice and Rosecrans, Lot 104, Russia Township, has showing of oil and gas at 940 feet. William Dempsey has a rig for No. 1 George Fisher, Lot 10, Avon Township.

In Cuyahoga County, C. A. McMillan's No. 1 Fuhrmeyer and Geisendorfers, Section 24, Independent Township, is rigging up.

In Holmes County, Ohio Fuel Gas Co. made a location for No. 1 Nettie A. Martin, Lot 11, Mechanic Township. Bell Brothers are drilling No. 1 Ross E. Conrad, Section 7. Lydic Oil & Gas Co.'s No. 1 Maggie Allison, Section 21, Monroe Township, is a gas well at 817 feet. Same company has a location on the Lloyd Alexander farm, Section 25, Monroe Township; rig for No. 1 Albert Burkey, Lot 10, Washington Township; rig for No. 2 Alonzo Bucy, Lot 9, and location for No. 2 Charles McFarland, Lot 11, same township.

In Summitt County, Butler & Co. is reported at 2,300 feet on the Robert Gillie farm, Section 13, Twinsburg Township. City Natural Gas Works has a rig up for No. 3 F. A. Ruff, Section 31, Rush Creek Township, and is drilling No. 1 Mertz and Moyer, Section 14, Pleasants Township. Pawnee Corp. is drilling No. 1 Board of County Commissioners, Section 3, Talmadge Township, and No. 1 Martin Rees, Section 16, Paris Township.

In Putnam County, Brown & Co. is drilling No. 1 Robert Baker, in Blanchard Township.

In Delaware County, Chester Wise is drilling No. 1 Herman D. Vance, Section 3, Orange Township, at 3,905 feet.

In Perry County, Kachelmacher is drilling No. 11 Hemlock Coal Co., Section 25, Coal Township. Mid-East Gas Co. has a rig on the C. C. Ansel & Co. farm, Reading Township. Perry Sturm has a rig on the E. L. Vansickle farm, Section 5, same township.

KENTUCKY

In Ohio County, Ekes & Engle's No. 1 E. Jones was dry in the Barlow. Snowden-McSweeney Co.'s No. 24 H. J. O'Dell 365 acres, produced an initial of 25 bbls. Same company's No. 3 J. W. Cheek was dry in the Jett, and its No. 4 produced an initial of 12 bbls. George Engle's No. 3 Kate Parton was dry in the Jett sand. Kentucky Natural Gas Co.'s No. 10 C. H. Dugan had an initial production of 35 bbls. Irvington Development Co.'s No. 1 Sullivan was dry.

In McLean County, J. B. Mayer's No. 1 Josh Ellenwood, Livermore area, produced an initial of 220 bbls. Kentucky Oil & Gas Products Co.'s No. 1 Shockley Brothers was dry.

In Hancock County, Joseph B. Mayer's No. 4 Margie Pool was a gas well, as was F. E. Patton's No. 1 Newland Springs Church area.

Rocky Mountain Area

TWO TESTS IN DENVER BASIN UNDER WAY; ONE DEEP TEST

By
T. R. INGRAM

DENVER, Colo., Nov. 4.—Two tests in the Denver Basin in eastern Colorado are getting under way, the Riddle Petroleum Co.'s operation at Derby having spudded and the Ramsey Petroleum Corp.'s deep test in the Linon district is rigging up.

COLORADO

Adams County

Riddle Pet. Co.'s No. 1 Baxter, C SW Sec. 2-3s-6w.
Spudded Oct. 9; set 20-in. surface pipe at 40 ft.; will run 15½-in. to 1,200 ft.

Archuleta County

William E. Hughes Est.'s No. 3 fee (unsurveyed), approx. SE cor. NW Sec. 24-33n-2e, 40 ft. N and 440 ft. W of No. 2.
Drlg. 245 ft.
William E. Hughes Est.'s No. 2 fee (unsurveyed), approx. SW Sec. 24-33n-2e.
Shut in at 1,120 ft. for pumping unit.
Oil City Pet. Co.'s No. 1-A Garnett, NW NE NW Sec. 25-33n-2e.
T.D. 1,515 ft. (S.L.M.); W.O. 4¾-in. pipe.
Navajo Oil Co.'s No. 1 Crowley, SW SW NE Sec. 11-32-1e.
T.D. 1,138 ft.; artesian water at 1,129-38 ft.; will S.O. with 5 3/16-in.

Baca County

J. H. Everett et al's No. 1, 330 ft. NW cor. Sec. 24-32-48.
Spudded water well.

Boulder County

Leslie R. Steele et al's No. 1 Maxwell, SW NE NW Sec. 24-1n-71.
Drlg. 2,220 ft., black shale; show of gas.

Elbert County

Ramsey Pet. Corp.'s No. 1, 200 ft. W of C Sec. 13-8s-57w.
Rig up.

Fremont County

Waterville Oil Co.'s No. 1 State, SE SE NW Sec. 16-18s-69w.
Landed 5 3/16-in. at 2,780 ft.; shut off show of oil and salt water and S.D. at 2,790 ft.

Grand County

Interstate O. & G. Co.'s No. 1 Hinman NE NE NW Sec. 11-2n-81.
S.D. 2,997 ft.

Huerfano County

S. W. Pressey's No. 1 Ojo, SW NE Sec. 10-28-69.
Collins & Quinn's No. 1, C W½ E½ Sec. 4-28s-68w.
T.D. 3,810 ft.; fshg. for whipstock.

Jackson County

Colorado Oil Ref. Co.'s No. 1 North Park Coal, NW NW Sec. 18-9n-78.
T.D. 1,805 ft.; fshg. for bailer.
Continental Oil Co.'s No. 3 Hoyle, NW NW N ESec. 34-9n-78.
T.D. 5,115 ft.; circulating oil preliminary to testing 20 ft. of oil sand in second Dakota.

Jefferson County

Ruby Hill O. & G. Co.'s No. 1 Braden, SE cor. Sec. 24-4n-69.
Drlg. 4,250 ft.

La Plata County

McGarr Pet. Co.'s No. - Pinon Mest, CSL NE NE Sec. 34-33n-12w.
Spudded Stp. 12; drlg. 785 ft. (first report).

Las Animas County

Mountain State Oil Corp.'s No. 1 Nickola, C NE NE SE Sec. 10-34-62.
S.D. 1,640 ft.

Lincoln County

Consolidated Smelting & Metals Co.'s No. 1 Hancock, NE NE Sec. 7-17s-52.
Bailer sidetracked; drlg. 1,830 ft.

Moffat County

Stanolind O. & G. Co.'s No. 16-X Parkinson, 220 ft. W and 618 ft. of NE cor. Lot 5 (SW NW NW), Sec. 23-4n-92w.
Drlg. 2,946 ft. in variagated shales.

Montezuma County

McElmo Oil Co.'s No. 1 West, NE NW NE Sec. 21-36n-17w.
T.D. 3,705 ft.; fishing for tools.

Morgan County

Swisher et al's No. 1 Lunt, 92 ft. W of E line and 360 ft. N of S line, Sec. 3-4n-60.
Drlg. 1,208 ft. in shale; enough gas to light on bailer; show of oil on slush pit.

Park County

South Park Co.'s No. 1 State, SE SE SW Sec. 16-11s-75w.
U.R. 6⅝-in. from 3,606 ft. to 3,658 ft.

Prowers County

Trojan O. & G. Co.'s No. 1 Lotus Oil, NW NE NE Sec. 15-23-4n.
Drlg. below 5,700 ft.; no information given out.

Routt County

Mid-Colo. Pet. Co.'s No. 1 Omhalt, NE NE SE Sec. 29-4n-87w.
Drlg. 2,780 ft. in top of Lakota; oil show.

Washington County

Fremont Buttes Oil Co.'s No. 1 Gilcrest, S WSE SW Sec. 22-3n-53w.
S.D. 200 ft.; 16½-in. at 137 ft.

WYOMING

Albany County

The Ohio Oil Co.'s No. 1 Emery, on the Big Hollow structure, which was started last month as a test to the Sundance, failed to find that horizon in place and will continue on to the Tensleep. The Forelle (Embar) is expected at around 2,500 feet. The Tensleep probably will be much deeper. The Dakota also was absent.

California Co.'s No. 2 Hoist, SW NE SE Sec. 13-17n-77.
Drlg. 3,983 ft.; Muddy at 3,078-3,100 ft.; not cored but believed saturated; good saturation in Dakota at 3,164-3,230 ft.; no Lakota.
California Co.'s No. 1 Wilson, NW SW SW Sec. 18-17n-76.
S.D. 1,010 ft. (cor.) for wtr.
Ohio Oil Co.'s No. 1 Emery, C SE NE Sec. 30-15n-75w.
Drlg. 2,343 ft. in red beds.

Big Horn County

J. W. Bales' No. 1 Parker, C SW SW Sec. 23-49-89.
S.D. 550 ft.
Peter Evanoff et al's No. 1 McAllister, Lot 40, NW NE SE Sec. 3-55n-97w.
Drlg. 2,900 ft.
Joan Oil Co.'s No. 1 Howell, NW SE NE Lot 63, Sec. 32-55n-97.
Drlg. 1,408 ft.
Kinney-Coastal Oil Co.'s No. 3 Government, SW NW NE Sec. 24-56n-98w.
T.D. 4,234 ft.; shot junk to sidetrack.
W. S. Gilbert's No. 1 Zaring, SE SE SE Sec. 35-52n-93w.
S.D. 850 ft.
Ohio Oil Co.'s No. 4 Byron Union, W SW NE Sec. 22-56-97.
Drlg. 337 ft.
Ohio Oil Co.'s No. 3 Sessions, NW SW NW Sec. 35-56n-97w.
Drlg. 3,989 ft. in Madison lime.
Montana-Wyoming Oil Co.'s No. 1 Allen, 210 ft. from N line, 936 ft. from E line, Lot 52 (NW SE NE), Sec. 32-56n-97w.
T.D. 3,170 ft.; rebldg. derrick.
Peay Oil Co.'s No. 2 Government, SE SE SE Sec. 10-55n-97w.4
Rig (cor.); S.D. indef.
J. H. Shaffer's No. 1 Keachie, C SW SW Sec. 7-49-91.
Drlg. 1,251 ft.
Wyoming O. & R. Co.'s No. 1 Evans, NE NE SW Sec. 12-49-91.
Set 1½-in. at 85 ft. (cor.) and S.D.

Carbon County

Ohio Oil Co. and California Co.'s No. 2 State, C NW NW Sec. 36-21n-79w.
Drlg. 5,430 ft.; expect to begin coring Sundance at 5,440-50 ft.
Ohio Oil Co.'s No. 5 Diamond Cattle, NW SW NW Sec. 35-20-78.
Water in Sundance at 3,262 ft.; P.B. to 3,217 ft. to test saturated sand at 3,163-3,223 ft.
Ohio Oil Co. and California Co.'s No. 1 Union Pacific, Acct. J, NE SW NW Sec. 25-21-79w.
Drlg. 3,200 ft.
General Pet. Corp.'s No. 1 Whitford, SW SE SE Sec. 24-20-84.
T.D. 5,500 ft.; reaming; 8¼-in. on rack.
General Pet. Corp.'s No. 1 Union Pacific, C SW SW Sec. 19-20-83.
S.D. 5,931 ft.; may be deepened.
Sinclair-Wyoming Oil Co.'s No. 9 Wertz, NE NW N WSec. 7-26n-89w.
Drlg. 2,760 ft.
Shirley-Wyoming Oil Co.'s No. 1 Government, NW NE Sec. 2-26n-80w.
Set 10-in. through Cloverly at 730 ft.
Union Oil Co. of Calif. and Mutual Oil Synd.'s No. 1 Union Pacific, SE SW SE Sec. 1-18-78w.
Spudding.

Converse County

Chadron-Osage Oil Co.'s No. 1 State, SW cor. Sec. 16-32-69.
S.D. 1,400 ft.
Continental Oil Co.'s No. 60 State, NW SW NE Sec. 9-33-76.
T.D. 4,865 ft.; R.U. blowout preventer.
Otto Olson et al's No. 1 Carey, Sec. 6-32-71.
S.D. 642 ft.
John Ackard's No. 1 Daniels, SW SW SE Sec. 17-32-71.
Drlg. 3,000 ft.

Fremont County

Mid-American Oil Co.'s No. 3 Government, NW NE SW Sec. 25-28-92.
Drlg. 1,403 ft.
Nelson & Poupiert's No. 3 Enos, Lot 7, Sec. 27-3n-1w.
Drlg. 1,100 ft.; showing for 1 bbl. of oil.

Hot Springs County

California Exploration Co.'s No. 2 Government, NW SW NW Sec. 7-44-96.
Coring 4,134 ft. in hard lime; saturated cores recovered in Embar at 4,037-89 ft.
Ohio Oil Co.'s No. 72 Millsiron Cattle Co., NE SE SE Sec. 19-46n-98w.
Drlg. 2,578 ft.
Stanolind O. & G. Co.'s No. 20 State-Ridgely, SE SE SE Sec. 19-46n-98w.
S.D.; derrick.

Laramie County

The Amerada Petroleum Corp. is reported to have leased up a block in Sections 1, 2, 10, 11, 13 and 15-13n-68w, 6 to 10 miles north of the Colorado boundary and 12 miles west and south of Cheyenne. Land signed up includes the James Morton and Bert McGee ranches. The company has been shooting that territory and northern Colorado for some time and several months ago was reported to have leased a block east of the Wellington dome on the Colorado side. The Wyoming acreage is due north from the Wellington Pool. In 1931 the Prairie Oil & Gas Co. had 25,000 acres in the same district and drilled its No. 1 Warren, SE NE SE Section 22-13-68, to 639 feet, where it was completed for an 8,000-bbl. water well.

Natrona County

The Midwest Oil Co.'s No. 26, C SE NW Section 25-40-79, Salt Creek Field, was completed at 1,562 feet as a key well for repressuring the second Wall Creek with gas.

Lincoln County

Senrab Oil Co.'s No. 3 Government, N SE NW Sec. 10-26-113.
Drlg. 1,063 ft.
Superior-Wyoming Oil Co.'s No. 2-B, Lot 3 (NW NW), Sec. 3-26-113w.
S.D. 890 ft.

Niobrara County

J. H. Huber's No. 1 Joss, which gives promise of extending the Lance Creek Pool half a mile to the west, failed to get a test when it ran tubing to bottom at 4,096 feet, in the red beds. It dropped the swab and line and is pulling tubing to fish out swab. It had a saturated sand in the Sundance at 4,003-42 feet and some water in sand at 4,042-78 feet. Some oil, gas and water were swabbed from the hole before the swab was lost. Bottom water probably will be cemented off before another test is made.

The Continental Oil Co.'s No. 3 Joss is a near completion.

The Riggs Drilling Co. will drill a second test on the Middle Creek structure in its No. 2 Spaugh Land & Cattle Co., three-fourths of a mile west and one location north of its No. 1, which was abandoned at 1,340 feet.

Black Hills Ref. Co.'s No. 1 Wyrick, C SW NE Sec. 28-36n-64w.
Derrick; W.O. rotary (first report).
Black Hills Ref. Co.'s No. 1 Mills Est., C SE NW Sec. 27-36n-64w.
Location (first report).
Continental Oil Co.'s No. 3 Joss, 200 ft. E of C NW NE Sec. 6-35n-65w.
Drlg. 3,874 ft.; dry sand 3,830-38 ft.; shale 3,838-42 ft.; sand 3,842-74 ft.; saturation at 3,848-59 and 3,860-74 ft.
J. H. Huber Co.'s No. 1 Joss, NE SE NW Sec. 6-35n-65w.
T.D. 4,096 ft.; fshg. for swab.
Interstate O. & R. Co.'s No. 1 Morrell, NW NE SE Sec. 9-19-51.
T.D. 3,030 ft.; P.B. to 2,835 ft.; S.D.
Fall River Royalty & Producers Co.'s No. 5- LBriggs, CSL NE NE Sec. 2-39n-61w.
Drlg. 385 ft.
Ohio Oil Co.'s No. 5 Converse Sheep, C SE SW Sec. 32-36-65w.
Rig up.
Ohio Oil Co.'s No. 7 Lamb, C NW NE Sec. 5-35n-65w.
Drlg. 1,720 ft. in shale.
S. & H. Dev. Co.'s No. 1-A Olinger, SE N ENW Sec. 1-36-63.
Drlg. 1,680 ft.
Riggs Drlg. Co.'s No. 2 Spaugh Land & Livestock, SW SW SW Sec. 32-34n-65w.
M.I. rig (first report).

Park County

Continental Oil Co.'s No. 4 Northern Pacific, NW NE SE Sec. 23-58n-98w.
Location.
Geo. T. Beck's No. 1 fee, NW SE NW Sec. 27-33-101.
Drlg. 1,585 ft.; fighting caves.
Garland Oil Co.'s No. 2 Government, SE NE NW Sec. 14-56-98.
S.D. 2,160 ft.
Resolute Oil Co.'s No. 1 State, C SW SW Sec. 16-57-101.
S.D. 3,608 ft.

Sheridan County

Beaver Creek Oil Synd.'s No. 1 Allison, SW SE Sec. 15-55-85.
Drlg. 2,821 ft.

Sublette County

Texas Co.'s No. 3-C, SE SE NW Sec. 34-27n-11w.
T.D. 781 ft.; cmtd. 6⅝-in. with 50 sacks.
Piney-LaBarge Oil Co.'s No. 2 Government, CEL NE NW Sec. 18-27-113.
Drlg. below 520 ft.

Sweetwater County

Mountain Fuel Supply Co.'s No. 1 Brooks, C NW NE Sec. 15-16n-104w.
W.O.C.; 12½-in. at 202 ft.
Vermillion Oil Co.'s No. 1 Government, SW SW SW Sec. 7-12n-99w.
Moving in material.
Sinclair-Wyoming Oil Co.'s No. 6 U.S.P., SW SW NW Sec. 11-26n-90w.
S.D. 2,330 ft.

Uinta County

Druscilla Connell et al's No. 5 Government, SW NW NW Sec. 24-15n-118w.
Drlg. 1,036 ft.
Intermountain Pet. Corp. of Utah's No. 1 Union Pacific-Hayes, SW NW SW Sec. 24-19n-118w.
T.D. 1,540 ft.; U.R. 5 3/16-in. to set on top of sand at 1,537 ft.; show of oil.
W. D. Marshall's No. 1 Government, NW SW SE Sec. 12-15n-118w.
Drlg. 531 ft.

Washakie County

Ariton & Doyle's No. 1 Government, SW SW SE Sec. 29-48-91w.
Wyoming O. & R. Co.'s No. 1 Frison, NW SW NW Sec. 14-48-91.
S.D. 1,710 ft.

Weston County

Conway Oil Corp.'s No. 1 Government, C SE NW Sec. 7-41-60.
Drlg. 2,235 ft.

. . . the Small Steel Valve with the Big Guarantee

Here is a small valve that ends small-valve troubles—a valve you can put into *any* field or refinery line under 2″ —and put in to *stay*.

Handles all pressures to 800 lbs.—at temperatures to 750° F.

Corrosion-resistant.

Machined from solid steel bar stock.

Replaceable stainless steel working parts.

Free replacement parts if the valve fails from *any cause* within five years.

Low cost—long life.

Eight sizes ranging from ¼″ to 2″.

Get the facts *now* on this money-saving, trouble-saving new valve.

Mail coupon for complete description and prices.

CHAPMAN

THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD, MASSACHUSETTS

Send me—without obligation—your bulletin describing the new Chapman List 960.

Name _____

Firm _____

Street _____

City _____ *State* _____

Des Moines-Osage Synd.'s No. 11, CNL NE NE Sec. 25-46n-64w.
Drlg. 700 ft.
Federal Oil Co.'s No. 3 Government, C NE SE Sec. 15-46-64w.
Running 8¼-in. at 1,200 ft.
Beaver Creek Oil Synd.'s No. 1 State, C NE NE Sec. 23-44-62.
Spudded and S.D.
Glenn Taylor's No. 1 Bock, C SW NE Sec. 3-45n-63w.
Running 8¼-in. at 300 ft.
L. C. Packman's No. 1, NW NW NW Sec. 19-46n-63w.
Resumed at 450 ft.; R.U. to run 8¼-in. to bottom.
Grytler Holm's No. 1 Apostal, NW SE SW Sec. 4-46n-63w.
S.D. 140 ft.
Osage Trust Co.'s No. 4, SE SW SE Sec. 8-46n-63w.
Spudding 66 ft. (first report).
Henry Egert's No. 2, SW NE SE Sec. 8-46n-63w.
Rig on loc. (first report).

MONTANA

Big Horn County

Daniels Pet. Co.'s No. 1 May, C SE SE Sec. 13-1s-33e.
Drlg. 2,700 ft.
Enterprise Oil Co. et al's No. 2 Lynde SW SW SE Sec. 21-6n-35e.
S.D. 3,590 ft.

Carbon County

Bailey Round Butte Oil Co.'s No. 1, 1,120 ft. W of E line atnd 3,140 ft. N of S line, Sec. 3-6s-23.
Drlg. 1,410 ft. (cor.).

Cascade County

C. Leonard Smith's No. 1, NE NE SW Sec. 14-22n-21.
S.D. 13e.

Choteau County

Mills & Decker's No. 1, NE NW Sec. 29-27n-13e.
Rig up.

Fallon County

Montana-Dakota Utilities Co.'s No. 1, NE NW Sec. 17-3n-62e.
Coring at 4,480 ft.; reamed to 4,411 ft.
Montana-Dakota Utilities Co.'s No. 74, NE SE SW Sec. 34-10-58e.
Drlg. 830 ft. (first report).

Fergus County

Button Butte O. & G. Co.'s No. 1 Woodward, SE SE SW Sec. 20-14n-24.
S.D. 3,095 ft.
Kalispel-Kevin Oil Co.'s No. 1 Emmons. 220 ft. W of E line and 2,140 ft. N of S line, Sec. 6-20-18.
Drlg. 2,240 ft. in basal Colorado; 6⅝-in. at 2,200 ft. (formerly Emmons, et al).
S. W. Pennock et al's No. 1 Nordheim, NW NE NE Sec. 6-21n-18e.
S.D. 480 ft. (corrected).
E. A. Fenholt's No. 1, NW NW SW Sec. 24-21n-17e.
Rigging up.
Judith Operating Co.'s No. 1 Government, C SW SW Sec. 26-22n-17e.
Drlg. 470 ft.; 200,000 ft. of gas in first bench of Eagle sand at 400 ft.

Gallatin County

Montana Gas & Pet. Corp.'s No. 1 Adams. SE SE SE Sec. 36-2n-1e.
S.D. 2,400 ft.
Ben W. Ryan's No. 1 Tice, NE NE NE Sec. 28-1n-2e.
Drlg. 2,555 ft.

Glacier County

The Montana Headlight Oil Co.'s No. 1 Allison, C NE NE Section 29-34-6w, a wildcat 2 miles west of the nearest producer in the Cut Bank Field, proved to be a failure at a total depth of 3,135 feet. It had the first Cut Bank sand at 3,035-70 feet and the top of the Ellis at 3,135 feet. The elevation is 3,675 feet. There were no shows of oil, gas or water.

Five completions and one new operation were reported in the Cut Bank area. The Montana Power Gas Co.'s No. 1 Neumuth Unit, 1,000 feet east of the west line and 2,640 feet north of the south line, Section 29-35-5w, was completed at 2,675 feet for 2,700,000 feet of gas daily, open flow. The Sunburst at 2,580-2,608 feet was dry. The Cut Bank was at 2,630-68 feet and the top of the Ellis at 2,668 feet. The elevation is 3,899 feet.

R. C. Tarrant's No. 5 Britton, C NW SW Section 12-34-6w, an inside well, had 2,000 feet of oil at 2,825 feet, total depth, but has not been tested. The Cut Bank was at 2,755-2,810 feet.

The Texas Co.'s No. 5 Mabel Morrison, NW NE NW Section 22-35-6w, pumped 108 bbls. first 12 hours at a total depth of 2,943 feet. Top of the Ellis was at 2,934 feet.

C. P. Castle's No. 3 State, C NW SW Section 36-35-6w, an inside well, flowed 105 bbls. first 24 hours at a total depth of 2,805 feet. The Cut Bank was at 2,705-90 feet and the pay at 2,761-90 feet.

The Texas Co.'s No. 1 Peterson, C W half Sec. 23-36n-5w, was dry and abandoned at 2,973 feet.
A. B. Cobb's No. 5 Walberger, C NE NE Sec. 35-35n-6w.
Rig.
Cobb-Pardee's No. 1 Morrison, 1,980 ft. S of N line and 75 ft. E of W line Sec. 24-33n-6w.
Drlg. 1,530 ft.
Consolidated Gas Co.'s No. 10 Tribal, Lot ½ (SW SW NE) Sec. 34-35-6w.
Drlg. 2,830 ft.
Consolidated Gas Co.'s No. 1 Simero, C NE SE Sec. 1-33n-6w.
Drlg. 1,500 ft.
Lon Crumley's No. 2 Jones, C NE SW Sec. 31-34n-5w.
Rigging.
Fowler et al's No. 1 Tweedy, SW SE SE Sec. 25-33-6w.
Drlg. 2,350 ft.
R. C. Jeffries' No. 4 Lukens, NE NE NE Sec. 12-33n-6w.
Fshg. 580 ft.; Colo. 555 ft.
R. C. Tarrant's No. 1 Thacker Bond & Mtg., SE SW NW Sec. 27-32-5w.
C.O. at 2,560 ft.; hole caving.
Montana Power Gas Co.'s No. 1 Connolly, NW cor. Sec. 7-33n-5w.
Drlg. plug; Colo., 525 ft.; 10-in. at 550 ft.
Montana Power Gas Co.'s No. 2 Peterson, 1,000 ft. E of W line and 2,640 ft. S of N line, Sec. 30-35n-5w.
Location (first report).
Montana Power Gas Co.'s No. 1 Rigney, C NW NE Sec. 2-35n-6w.
Drlg. 1,700 ft.
P. M. K. Pet. Co.'s No. 2 Haglund, Sr., NW NW NE Sec. 14-36n-6w.
Drlg. 1,450 ft.
Royalite Co.'s No. 1 Hagen, NW SW Sec. 4-31n-7w.
Location (first report).
McCabe & Jeffries' No. 2 Government, SW NE SE Sec. 32-35n-5w.
Drlg. up baller at 2,580 ft.
Santa Rita O. & G. Co.'s No. 1 Shearon, 660 ft. S of N line and 348 ft. W of E line, Sec. 34-36n-6w.
M.I.M.
Santa Rita O. & G. Co.'s No. 1 Jacobson, C NE SW Sec. 8-33n-5w.
T.D. 2,710 ft.; drlg. by tools.
Santa Rita O. & G. Co.'s No. 6 Tribal, C S half SE Sec. 16-35n-6w.
Location (first report).
R. C. Tarrant's No. 4 Miller, 100 ft. N of C SE NE Sec. 24-34-6w.
Drlg. 550 ft.; Colo., 465 ft.; 10-in. at 490 ft.
R. C. Tarrant's No. 3 Getty, NW NW SE Sec. 2-34-6w.
Drlg. 2,700 ft.
R. C. Tarrant's No. 2 Hope, NW SW SW Sec. 18-34n-6w.
Rigged.
R. C. Tarrant's No. 6 Britton, C SE SW Sec. 12-34n-6w.
Rig on location (first report).
R. C. Tarrant's No. 3 Williams, C SE NE Sec. 11-34n-6w.
Drlg. 1,030 ft.
R. C. Tarrant's No. 2 Jones, NW NW SW Sec. 31-34n-5w.
Rigged.
Texas Co.'s No. 2 Long, SW NE SW Sec. 23-35n-6w.
T.D. 2,804 ft.; 7-in. at 2,802 ft.
Yukon Oil Co.'s No. 1 Federal Land Bank 440 ft. N and 666 ft. W of SE SW Sec. 11-34n-6w.
Location.

Liberty County

Western Natural Gas Co.'s No. 1 Wallace, C SW NW Sec. 15-37n-4e.
Drlg. 1,240 ft.

Park County

Ben W. Ryan et al's No. 1, NE Sec. 28-2n-11w.
Ready to spud.

Petroleum County

H. H. Schwart' No. 7 Government, NE SW SW Sec. 11-15n-29e.
Drlg. 1,350 ft. (first report).

Pondera County

Dave Mills' No. 1 Erickson, SW SW SW Sec. 3-27n-4w.
Rigging (first report).
Texas Co.'s No. 1 Unit 2, NE SW NW Sec. 21-30n-5w.
Rigging.

Phillips County

Little Rocky Dev. Co.'s No. 1, SE SE SE Sec. 17-24-24.
S.D. to finance at 352 ft.
Phillips Dev. Co.'s No. 6 Government, NW SW Sec. 2-24-24e.
S.D. 659 ft.; show gas at 563-604 ft.; water at 650-59 ft.

Stillwater County

Continental Oil Co.'s No. 1 Parker, 500 ft. N of S line and 660 ft. E of W line, SE Sec. 25-5s-17e.
T.D. 3,227 ft.; cored sand and shale at 3,222-24; sand, 3,224-27 ft.; Lakota at 3,210-13 ft., dry.

Toole County

The Monopeg Oils, Ltd. No. 3 Dipple, S SW NW Section 28-35-1w, in

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the Kevin-Sunburst Field, is suspended indefinitely at 1,355 feet after tools were recovered and contractor moved off. The Ohio Oil Co.'s No. 2 Sindon, NW cor. Section 1-35-2w, was dry and abandoned at 1,667 feet. The Sunburst at 1,480-1,510 feet was dry.

Carscallen & Mitchener's No. - Greuger, C S half NE Sec. 10-34n-2w.
Drlg. 1,542 ft.
Cassidy and Cassidy's No. 1 Welch, 220 ft. W of E line, 660 ft. N of S line, Sec. 31-35-2w.
T.D. 1,630 ft.; fishing for tools.
Coolidge & Coolidge's No. 4 O'Hara, NE NE SE Sec. 35-36n-2w.
Drlg. 1,030 ft.
Huso Brothers' No. 3 Government, SW NE SE Sec. 14-35n-3w.
Drlg. 1,000 ft.
Imperial-Craig Oil Co.'s No. 17 Bloom, Sec. 19-35n-1w.
Drlg. 515 ft.
Fred R. Mauger's No. 1 Government, SW NE NW Sec. 13-35-2w.
Drlg. 1,492 ft.
W. M. Hanlon's No. 3 SW NW SE Sec. 27-35n-3w.
Drlg. 1,712 ft. (first report).
Wm. McKnight's No. 2 Seabrook, SW NW SW Sec. 19-35n-2w.
Drlg. 580 ft.
Nepsted - Montgomery - Farther's No. 1 Haugen, NE NW NE Sec. 11-35n-3w.
Drlg. 1,000 ft.
Nepsted - Montgomery - Farther's No. 1 Grass, 660 ft. W of E line and 220 ft. N of S line, Sec. 17-35n-1w.
Rigging.
Ohio Oil Co.'s No. 8 Reeg, NW NW SW Sec. 14-35n-2w.
Location first (report).
Pfabe & Engleking's No. 10 Government, SW SW SE Sec. 19-35n-2w.
T.D. 1,511 ft.; Ellis-Madison at 1,509 ft.; dry; will acidize.
E. D. Reickhoff's No. 2 Government, SW SW NE Sec. 3-35-3w.
T.D. 1,034 ft.; running 8¼-in. to 970 ft.
Stock Brother's No. 3 Haggerty, NW SW SW Sec. 13-35n-2w.
T.D. 1,524 ft.; Ellis-Madison at 1,483 ft.; small well; will acidize.
R. C. White's No. 1 Haugen, NE NE SE Sec. 11-35-3w.
Drlg. 900 ft.
C. Leonard Smith's No. 1 Eckhoff, C SE Sec. 6-33n-2e.
S.D. 575 ft.
C. Leonard Smith's No. 1 Federal Land Bank, C NE NE Sec. 11-33n-1e.
Spudding at 175 ft.
C. Leonard Smith's No. 1, I. Halverson, C NE SE Sec. 18-33n-2e.
S.D. 730 ft.; tested 500,000 ft. of gas at 720 ft.
C. Leonard Smith's No. 1 H. Halverson, NW NE Sec. 18-33n-2e.
Drlg. 560 ft.

UTAH

Grand County

Columbia Crude Co.'s No. 1 Rath, SW SE Sec. 12-25s-20e.
S.D. 80 ft. (cor.)
Utah Southern Oil Co.'s No. 1 Hyde, SE NW NW Sec. 3-22n-22e.
Spudding 400 ft. in 12½-in. hole.

Summit County

Longwell Pet. Co.'s No. 1, SE SW SE Sec. 25-3n-5e.
S.D. 1,210 ft.

Utah County

Diamond Oil Co.'s No. 4 Government, CSL SE NW Sec. 16-8s-5e.
Drlg. 4,381 ft.

Washington County

Arrowhead Pet. Co.'s No. 2 Escalante, NW NW NE Sec. 19-43-15.
T.D. 4,114 ft.; P.B. to 3,250 ft.; shot and C.O.
Arrowhead Pet Co.'s No. 1-A, SE SW NE Sec 1-43-15.
Drlg. 2,640 ft.
Anna V. Toney's No. 1 Toney, CNL NE SE Sec. 33-40s-11w.
Drlg. 370 ft. (first report).
W. W. Toney's No. 1 Government, CNL SE SW Sec. 18-41s-12w.
Drlg. 185 ft. (first report).

NORTHWEST NEW MEXICO

Bernalillo County

Norine Realty Co.'s Inc.'s No. 1 Gallegas grant, SE SW NW Sec. 19-11n-4e.
S.D. 630 ft.

McKinley County

Co-operative Prod. & Ref. Co.'s No. 1 fee, SW cor. Sec. 21-20n-9w.
Drlg. 540 ft.; shale.
Lark Drlg. Co.'s No. 2 Santa Fe, NE NW NE Sec. 29-20n-9w.
Spudding.
Montrose Oil & Gas Co.'s No. 1 State, NE NE Sec. 28-20n-9w.
Drlg. 100 ft. (first report).
S. Dysart et al's No. 1 Bouton, E NW NE Sec. 14-4n-10w.
O.W.D.D.; resumed at 1,365 ft.

Quay County

Danube Drlg. Co.'s No. 1 Will Wallace, NE NE SE Sec. 12-9n-32e.
T.D. 1,000 ft.; prep. to run 8¼-in.
Quay County Dev. Co.'s No. 1 Wallace, SW SW SE Sec. 19-9n-33e.
T.D. 816 ft.; rainbows at 814 ft.; show of salt water at 775 ft.

Rio Arriba County

El Vado Structure Properties Co., Ltd.'s No. 1-A Tierra Amarilla grant, NE Sec. 26-3s-1e (unsurveyed).

Sandoval County

Continental Oil Co.'s No. 1 L-Bar Cattle Co., CEL SE NE Sec. 2-13n-4w.
Drlg. 5,061 ft.; blue shale, 5,007-41; hard white sand, 5,041-45; blue shale, 5,045-61.

San Juan County

Aztec Coop. Oil Co.'s No. 1 Greer, SE SE SW Sec. 10-30n-11w.
S.D. 332 ft. in shale.
J. F. Cross et al's No. 1 Wilson, SW SW SE Sec. 17-30-11w.
S.D. 310 ft.
Cross & Poole's No. 1 Aztec, Sec. 1-30-11w.
Making water shutoff at 740 ft.
Kutz Canon O. & G. Co.'s No. 1 Day, SW SW SW Sec. 20-28-10.
T.D. 4,400 ft.; fishing for tools.
R. C. Oswell's No. 4 Government, SW SW NE Sec. 34-30-11w.
S.D. 1,790 ft.
R. C. Oswell's No. 6 Government, SE NE Sec. 33-30-11w.
Spudded and S.D.
Phillips & Spence's No. 2 Martin, NW NE SW Sec. 34-30n-11w.
Comp. for 238,000 ft. gas in sands at 937-49 ft. and 1,013-19 ft.
Reserve Oil Co.'s No. 6 Shaffer, SE NE SE Sec. 36-22n-14w.
Location.
San Juan Pet. Co.'s No. 1 Lemley, NE SE SE Sec. 32-30-11w.
S.D. 1,314 ft.
Southern Union Gas Co.'s No. 1 Government, C NW NE Sec. 14-28n-11w.
Moving in material (first report).
Nick Spatter's No. 1 fee, C NE SW Sec. 32-31-11w.
S.D. 1,745 ft. for pipe.
W. R. Webb's No. 2 fee, C NE NW Sec. 6-30n-11w.
Location (first report).
W. R. Webb's No. 1 fee, CEL NE NW Sec. 6-30-11w.
P.B. from 1,500 ft. to 1,350 ft.; testing.

San Miguel County

Cabra Springs O. & G Co.'s No. 1 Thompson, SW NE NE Sec. 22-12n-22e.
S.D. 4,030 ft.
Cabra Springs O. & G. Co.'s No. 2 West Pino Mesa, SW SW NW Sec. 31-12-22.
S.D. 726 ft.
Pioneer Oil Co.'s No. 2 Monteuma, CSL SE SW Sec. 14-15n-16.
Drlg. 300 ft.
Starr-Kennedy Oil Co.'s No. 3 Abrams, NE NE SE Sec. 25-17-16.
Standing at 5,090 ft. after completing rig; to resume following fire.
Holmberg Interest's No. 1 Cantwell, NW NW NW Sec. 5-10n-9e.
S.D. 810 ft. (corrected).
Kelsey Clients Dec. Est.'s No. 2 State, C NW Sec. 22-10n-10e.
S.D. 1,450 ft.

Torrance County

The Estancia Valley Carbon Dioxide Development Co.'s No. 1 Kellogg, NW NE Section 12-7n-7e, Wilcox District, which was drilled to augment the supply of carbon dioxide gas for the Witt Ice & Gas Co.'s dry ice plant at Witt Station, was completed at 1,268 feet, total depth, from the pay at 1,264-68 feet. It has not been tested, but the flow is estimated at 750,000 to 1,000,000 feet a day, or about double the present capacity of the wells on production. It has been shut in for pipe line connections. The company will drill two more wells at once. Dean E. Winchester, of Denver, who spotted the No. 1 Kellogg, will recommend the locations for the additional wells. The plant has a rated capacity of 15 tons of ice a day.

48 Pet. Co.'s No. 1 Greenfield, C NW SW Sec. 17-9-8e.
Drlg. 900 ft. gray sand.
Bruce Fraier's No. 1 Graier, SE Sec. 12-2n-31.
Drlg. 1,210 ft. in granite wash water at 882-86 ft.
Quaker States Oil Co.'s No. 1 Zurich, NW SE SW Sec. 2-21n-34e.
Spudding 110 ft. (first report).

Union County

Sierra Grande Oil Corp.'s No. 2 Rogers, C NE NW Sec. 4-29-20.
T.D. 2-715 ft. in granite.

Valencia County

Ringle Dev. Co.'s No. 2 Tome grant, C NE SE Sec. 20-6n-3e.
Rigged and S.D.
Ringle Dev. Co.'s No. 1 Tome grant, C SE SE Sec. 36-6n-3e.
S.D. 400 ft.
Western Natural Resources Corp., Inc.'s No. 2 San Clementer, SE SE NW Sec. 5-6n-1e.
T.D. 6,001 ft.
Pres-Sel. Dev. Co.'s No. 1 Toltee, NE SW SW Sec. 20-12n-10w.
S.D. 270 ft.

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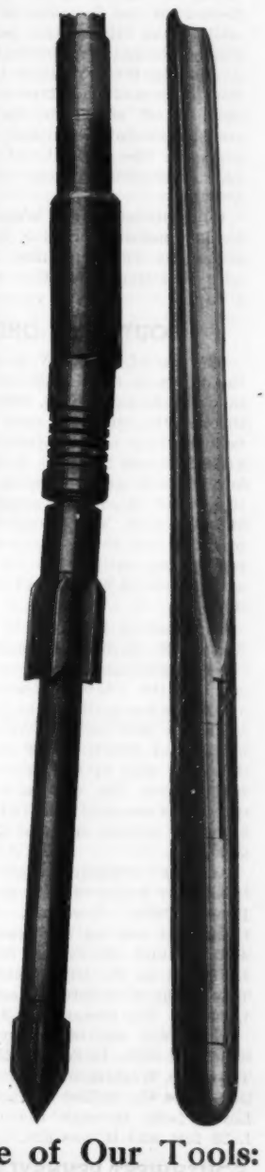

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Eastern Field Report

By STAFF CORRESPONDENT

ORISKANY TEST FAILURE IN COLUMBIANA COUNTY, OHIO

PITTSBURGH, Pa., Nov. 4.—The continued steady demand for Pennsylvania Grade crude and strengthening of the refined markets is reflected in the increase in price, as well as the fair balance between refinery demand and production. Production in West Virginia is still below pre-curtailment days and as the head is off of all the recent flush pools a continued natural decline is expected. The majority of the more recent completions have been in gas areas.

Completions in the lower Eastern fields consisted of five dry holes, seven gas wells and nine producers with an initial production of 42 bbls. a day.

SOUTHEAST OHIO

The test of Robert W. Cushing and the others on the Nila McIntyre farm in Columbiana County, Ohio, drilled through the Oriskany sand and is a failure. Top of the Oriskany was 4,584 feet and the tools went 18 feet lower. There was a showing of about 10,000 feet of gas and about 15 bbls. of salt water. The Corniferous lime was 225 feet thick. The owners are considering drilling to the Clinton sand, about 6,500 feet at this location.

The location is in the W half NE Section 28, Madison Township, about one-half mile north and west of Glascow on the Glascow anticline and about 2 miles north of the good Oriskany gas well on the William Jenkins farm, which found top of the Oriskany sand at 4,543 feet or 3,244 feet sub-sea. The test on the McIntyre farm reached the Oriskany at 3,336 feet sub-sea or about 92 feet up structure.

Another Oriskany sand test in Ohio, near Salineville, in Section 21, Brush Creek Township, Jefferson County, is nearing the sand. Brooks Johnson and others are drilling at 4,575 feet on the Clyde Smith farm. Top of the Corniferous lime was at 4,530 feet. The elevation is 1,315 feet.

There was one other dry hole in Southeast Ohio. In Section 25, Wesley Township, Washington County, Speary Oil & Gas Co. drilled on the J. Vern Leyde farm through the Berea to 1,828 feet and it was dry.

SOUTHWEST PENNSYLVANIA

The Oriskany sand test of John Galey and others on the William Graham farm on Brush Run in South Beaver Township, Beaver County, is still short of completion. The cave bridged over the hole on top of the lime shutting off the flow of gas, but as the tools are nearing bottom there is intermittent blowing of the gas evidencing a fairly high rock pressure. It is expected the well will be shot within a few days.

In Springhill Township, Greene County, Herds Run Oil & Gas Co. completed deepening No. 5 on the John Dye farm at 3,500 feet, showing for 6 bbls. with 146,000 feet of gas from the Fourth and Fifth sand, oil being at 3,346 feet. The Pittsburgh Coal was at 1,171-80 feet.

In Morris Township, Carnegie Natural Gas Co. is drilling at 2,270 feet on the Lucinda Hunt farm. In Center Township, Rutan Oil Co. is down 3,205 feet on the No. 3 C. T. Harvey. Top of the Nineveh Thirty-foot sand was at 3,038 feet with a showing of oil at 3,056 feet. The Gordon sand was at 3,166-81 feet with a showing of oil at 3,173 feet.

In Richhill Township, Greene County, Lewis & Co. are drilling at 200 feet on the Samuel Chess farm. David Braddock is drilling at 1,105 feet in No. 8 on the Newton Braddock farm on Crabapple Run. Wasmuth & Callahan shut down for engine repairs in No. 3 on the Daniel Goodwin farm at 2,050 feet. In Alleppo Township, G. B. Patterson is down 1,650 feet on the John S. Wise farm.

In Amwell Township, Washington County, Moore-Orrill & Co. are drilling at 1,690 feet on the C. E. Hackney farm. Carnegie Natural Gas Co. is down 2,492 feet on the C. W. Dunn farm. Union Gasoline & Oil Corp. has reached 2,000 feet on the Charles Vankirk farm.

In South Franklin Township, Washington County, Carnegie Natural Gas Co. is spudding on the John Dodd farm. New Oil & Gas Co. is drilling at 2,668 feet on the James Dodd farm. E. H. and J. B. Tague have reached 560 feet on the No. 2 Hiram McClain. Pittsburgh Coal was at 553 feet.

Deep Test

In South Shenango Township, Crawford County, Carnegie Natural Gas Co. shut down on account of water in the Oriskany sand on the Gertrude Scott farm after drilling through the sand. Casing has been run to 3,115 feet and the hole will be deepened.

WEST VIRGINIA

In Pleasants County, Smith & Hendershot completed a test on the J. J. Simonton farm in Lafayette district at 1,900 feet, showing for 5 bbls. with 200,000 feet of gas. Producing sands were the Third Salt, Maxon and Big Injun.

In Grant district, Pleasants County, O. J. Galbert and others completed a test on the W. P. Naish farm in the First Salt sand at 560 feet, showing for 5 bbls. C. L. Barron completed No. 4 on the Robert Brothers lease at 532 feet, the First Salt sand, good for 5 bbls. Royal Craig, Foggin and others completed a test on the J. B. Franklin farm at 820 feet, Cow Run sand, showing for 5 bbls.

In Ritchie County, L. N. Rinehart and others, drilling as the Western Turn Oil Co., completed No. 3 on the A. J. Glass farm in the Injun sand at 1,865 feet, a 5-bbl. pumper. Southwest of the Lost Run Pool, W. D. Gribble completed a test on the J. W. Leonard heirs farm in the Injun sand, 1,705-95 feet, a 4-bbl. producer. John Trexler completed a second test on the William Butcher farm in the Keener and Big Injun sand, total depth 1,780 feet, good for 5 bbls. and 65,000 feet of gas.

Deep Tests

Drilling in Kanawha County to the deeper sands still attracts interest. Columbian Carbon Co. is drilling on the S. H. Hoge farm at the mouth of Davis Creek about 1,000 feet west, 20 degrees north, of the gas well on the Kanawha City Co., Loudin district.

The next test to reach the Oriskany is that of South Penn Oil Co. on the Kate C. Scott farm in Malden district. It is drilling at bottom of the Lime with casing set to top of the Corniferous lime. Godfrey L. Cabot, Inc., is down 1,600 feet on the W. D. Lewis test and 675 feet in the Campbells Creek Coal Co. No. 9 and has rig completed on the N. B. Tompkins farm. Columbian Carbon Co. is drilling at 1,035 feet on the M. J. Dearing heirs farm.

In Elk district, Kanawha County, this company is down 1,890 feet in the second test on the G. and D. Copenhaver farm and 1,385 feet on the W. L. Burdette test. Yoak Oil & Gas Co. is at 4,845 feet in deepening on the W. T. and J. H. Goshorn farm.

In Loudin district, Godfrey L. Cabot, Inc., is drilling at 4,165 feet on the A. F. Vorholt test and 991 feet on the Kanawha Land Co. lease. In Union district, this operator has reached 1,800 feet on the Alberta Putney farm.

In Jefferson district, Kanawha County, Benedum & Trees have reached 6,200 feet, Clinton sand, on the Joseph Hill farm, and it will be drilled deeper.

Other Operations

In Upshur County, Warren district, 3 miles above the Pleasant Valley Church on Hackers Creek, Columbian Carbon Co. has started drilling on the I. M. Bennett farm, 13 miles from production but near some gas.

In Boone County, Pure Oil Co. is spudding No. 78 on the Federal Coal Co. tract in Sherman district. In Washington district, Owens Illinois Glass Co. is drilling at 885 feet on the James Estep farm. In Scott district, its test on the Mamie Ballard and others farm is down 1,690 feet.

In Cabell County, Sureshot Torpedo Co. and others are drilling on their own property in Union district. In McComas district, United Fuel Gas Co. has started drilling on the Walter Ray farm. West Virginia Gas Co. is in the Brown shale on the George W. Savage farm and will complete this week, as will the test of Toms Creek Gas Co. on the C. W. Meelingh farm, which is at 3,300 feet. R. H. Sadkins and others are down 1,400 feet on the R. L. Johnson farm.

In Doddridge County, Clifton Oil & Gas Co. are drilling at 300 feet on the Dallas Powell farm on Israel Fork of Big Flint Creek in Grant district.

In Gilmer County, H. S. Adams and others are building a rig for No. 3 on the Ivy Gainer farm in Center district. Hope Natural Gas Co. is down 3,575 feet on the K. C. Simmons farm and West Virginia Gas Co. 1,765 feet on the John J. Gerwig farm.

In Kanawha County, Rex Oil & Gas Co. has started drilling No. 5 on the Goshorn heirs farm on Rich Creek in Big Sandy district about 1,800 feet west of No. 4. In Elk district, Marshall & Price have a location on their lease on the Goshorn and others lands. In Loudin district, H. C. Zogg is drilling on the R. H. Dunn farm.

In Ritchie County, J. W. Rowland and others have a rig on the Henry Bunner farm in Grant district. Ralph C. Jackson is drilling a second test on the Simeon and L. E. Tennant farm. In Murphy district, on Dry Run, Collins & Wilson are drilling on the Aaron A. Lingler farm at 1,750 feet. About 2,500 feet east, W. H. Mosser and others are down 1,350 feet on the G. L. Goff test. One mile south of Smithville on the Hughes River, W. H. Bickel is drilling a second test on the Holt heirs farm. Near the Wirt County line on the head of Right Fork of Laurel Run, South Penn Oil Co. has started drilling a second test on the George L. Haught farm. Samuel M. Summers has a rig for a second test on the Ida E. Jones farm. Patterson & Pope have a location on the W. H. Patterson farm. W. A. Bickerstaff has a rig up on the C. G. Wright farm. Busch Brothers have rigged up on the Mahala Tingler farm. A. H. Jackson is drilling on the W. B. Cunningham farm.

In Roane County, E. H. Brannon and Walter McMillen and others have resumed drilling on the Kaufman & Oppenheimer farm in Smithfield district. In Harper district, Hillcraft Gas Co. is drilling at 1,550 feet on the L. P. Fields heirs farm. In Spencer district, Charles Heasley has started drilling on the A. B. and R. B. Newman farm. McKown Gas Co. is down 725 feet on the Dillon McKown farm. In Curtis district, H. H. Staats is drilling a second test on the R. R. Petty farm and has reached 1,265 feet.

Oklahoma Operations

By JAMES McINTYRE

PRODUCTION MUDDED OFF IN BIG DEEP WELL IN FOX POOL

In an effort to remove the drill stem from Carter Oil Co. and others' No. 1 Ruth Williams, SW NE SW Section 27-2s-3w, in the old Fox Field which blew in last week, the Carter Oil Co. operating the property has pumped one batch of 600 sacks of Baroid mixed with 5 per cent Aquagel through the drill stem and into the bottom of the hole at a depth of 8,088 feet. The drill stem was within 18 feet of bottom when this fishing job started and the crew has succeeded in removing one joint of the drill pipe so the bit is now within about 50 feet of bottom.

After pumping in the Baroid-Aquagel mixture which weighed 13 pounds per gallon and required a pump pressure of about 500 pounds to force it into the hole, another batch of about 500 bbls. of mixture of Baroid, Aquagel and a sugar cane fiber was pumped into the hole and apparently sealed the caving shale formation. This mixture helped in the open hole below 4,909 feet of 9-inch casing, but another trouble developed through bridging inside the 9-inch casing at a point about 4,000 feet below the surface.

The crew is now trying to free the drill stem and if this can be removed from the hole they have 7-inch O.D., Grade D, 28-pound seamless casing on hand ready to run to a depth of about 8,050 feet. When this pipe can be run it will be cemented and then the well can be completed in proper manner and put on production.

The trouble in the well apparently has been caused by caving of the Sylvan shale encountered at 5,435 to 5,735 feet and filling the annular space between drill stem and hole with loose material which settled back around the drill pipe when circulation was cut off to pull the pipe last week.

To relieve the stuck pipe about 2,000 gallons of hydrochloric acid was pumped to the bottom of the hole through the inside of the drill stem and when the acid hit the formation at the bottom of the hole the well came in out of control although the flow of oil and gas, 10,000 bbls. of oil and 12,000,000 feet of gas per day, did not clean the hole of cavings.

The pay is in the Simpson section and probably a lime, and is an unknown factor regarding possible volume of oil and gas to be recovered. It is below the Wilcox formation, which is missing and it is therefore doubtful as to just how good a well this will make and whether the total oil recoverable will pay for the drilling of the deep hole and the expense of repairing the well now trouble has developed. The well does not open any definite area to probable production because the oil and gas has been encountered so far below the base of the Viola, where the Wilcox sand should have been encountered, that it is hard to say from which formation the production is being secured.

The principal thing determined by the well seems to be the possibility of finding saturated areas of the same kind south of the Arbuckle Mountains but just how the producing companies are to go about determining where these deep tests shall be drilled is difficult to outline at this time. Structure in the oil fields will be studied carefully and geophysics applied to the area to try to outline lower structures but it will be necessary to drill deep holes to prove the area and the returns made on this first well will largely determine the future course of other companies.

The Fox Pool's 8,088-foot 10,000-bbl. well continues to make this area the hot spot of Oklahoma

Grant County Wildcats

An interesting event of the past week was faint showings of oil and gas in cores taken in Shell Petroleum Corp.'s wildcat in Grant County, No. 1 Foster, NW NW SE Section 30-27-8w. Viola lime was topped at 5,937 feet and a core was taken at 5,942-52 feet. Nine feet of core was recovered and the last foot had a slight gassy odor. A faint showing of oil was shown in a core taken at 5,932-37 feet. Twelve miles south of this well, Helmerich & Payne's No. 1 Crouse, which flowed mud and some oil when the casing was shot off at 4,343 feet, went back in the hole and drilled to 4,520 feet and the returns came up between the 8-inch and 15-inch pipe. The tools were pulled out and the crew was trying to pull the 8-inch pipe. This test is C NE SW Section 29-25-8w.

Fitts Pool

J. G. Catlett recompleted No. 1 Smith, SW SW NW Section 28-2-7, in the Fitts Pool, deepened from 4,165 feet to 4,284 feet. On its potential test it was credited with 2,468 bbls. in 24 hours, with 1,218,000 feet of gas. It is a Bromide and McLish producer.

Magnolia Petroleum Co.'s No. 3-A Simpson, 255 feet from south and 330 feet from east lines of NE quarter Section 29-2-7, made a potential of 3,526.8 bbls. at a total depth of 4,285 feet. Bromide was topped at 3,962 feet, sands at 4,057 and 4,190 feet, McLish at 4,170 feet and sands at 4,195 and 4,251 feet.

Moore and others' No. 1 Witherspoon, NW SE NW Section 31-2-7, is a belated completion. Late in August it flowed 110 bbls. in 24 hours on the gas lift after an acid treatment. It had a hole full of water at 4,595 feet and was plugged back to 4,520 feet. On a recent test it pumped 243 bbls. of oil in 22 hours.

In the Allen district, Pontotoc County, Cornell & Bradley abandoned No. 1 Gilson, SW cor. Section 14-5-8, at 873 feet.

New work in the Fitts Pool included Blackstock and others' No. 1, C N half SE NE NE Section 35-2-6, building rig; Mid-Continent Petroleum Corp.'s No. 1 McKoy, SW SW SW Section 20-2-7, location; Blackstock and others' No. 1 Daniels, SE SE SW Section 21-2-7, digging cellar; Moore and others' No. 1 Mack, SW NW SE Section 28-2-7, location; Moore & others' No. 1 McKoy, NE SW SW Section 28-2-7, cellar; and No. 8 McKoy, SE SW SW Section 28, a location; same operators' No. 9 Schauers, NE SE NW Section 29-2-7, corrected location; and No. 13 Schauers, NW NW NW Section 29-2-7, cellar and pits; Magnolia Petroleum Co.'s No. 6 Simpson, 890 feet from south and 975 feet from east lines of NE quarter Section 29-2-7, building rig; Carter Oil Co.'s No. 12 Richards, NE SE SE Section 30-2-7, moving in tools to deepen from 4,083 feet, 3 feet in McLish, and moving in tools to deepen No. 2 Smith, NE NE NE Section 31-2-7, from 4,002 feet, 27 feet in McLish.

Continental Oil Co.'s No. 1 McCarty, C SE NW Section 12-1-7, has had the tools fished out of the hole and the well showed a 15,000,000-foot gas production. The crew was installing a control head. McLish lime was topped at 4,427 feet and was penetrated 19 feet.

Phillip Boyle's No. 1 Crist, SW cor. SE SW Section 30-5-4, northern Pontotoc County, had saturated sand at 1,975-2,007 feet and set 7-inch pipe at 1,935 feet. This is an offset to the same owner's No. 1 McCracken, which was recently reported as abandoned, but which Mr. Boyle says is producing oil.

Oklahoma County

In the Oklahoma City Field eight wells were completed. Indian Territory Illuminating Oil Co.'s No. 7 Little, C SW NE NE Section 27-11-3w, and the same company's No. 5 Wisel, SE cor. Section 26-11-3w, which had never been completed although they were drilled to Wilcox sand early in the year, have finally been taken off the list of drilling wells. No. 1 Wisel is a very small well and the other is good for no more than 40 bbls. a day. They may be abandoned.

Larkin & Warr's No. 1 Frisco, 635 feet from north and 360 feet from east lines of NW quarter Section 1-11-3w, was given a 910.56-bbl. potential. It was tested on the gas lift and made 261.66 bbls. in six hours from Wilcox sand at 6,221-6,321 feet.

Sunray Oil Co.'s No. 3 County land, 63 feet from north and 501 feet from east lines of NW quarter Section 1-11-3w, had Wilcox sand at 6,295-6,430 feet and it produced 3,204.14 bbls. in six hours, and 2,122 bbls. the last four hours, giving the well a potential rating of 13,273 bbls. in 24 hours, with gas at the rate of 9,725,000 feet per day.

Phillips Petroleum Co.'s No. 1 Etta, 643 feet from south and 665 feet from east lines of NE quarter Section 34-12-3w, had Wilcox sand at 6,272-6,408

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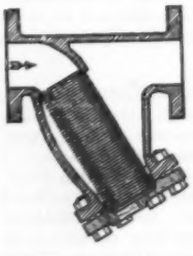

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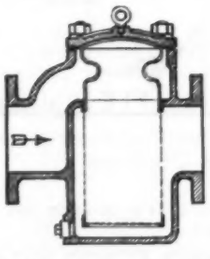

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feet, total depth 6,433 feet. The well flowed 967.25 bbls. in six hours, producing 632 bbls. in the last four hours, giving it a potential of 3,822 bbls., with gas at the rate of 22,000,000 feet per day.

Phillips Petroleum Co.'s No. 1 Troy, 116 feet north and 628 feet east of C Section 26-12-3w, was abandoned at 6,585 feet in Sylvan shale.

Erie Oil Co.'s No. 1 Fuller, 335 feet from south and 153 feet from west lines of NW quarter Section 35-12-3w, had Wilcox sand at 6,275-6,355 feet, which was shot. When tested the well produced 2,000,000 feet of gas and a spray of oil amounting to 2 bbls. per hour.

Larkin & Warr completed No. 1 Fairgrounds, SW cor. SE SW NW Section 36-12-3w. They had not taken a potential test, but the well had flowed 1,044 bbls. in 17 hours with gas at the rate of 7,500,000 feet per day, after it was bailed. It produces from Wilcox sand at 6,355-6,463 feet.

In the Edmond Pool, Marathon Oil Co. completed No. 1 Ramkins, SE SE SW Section 31-14-3w, made a potential of 1,873.32 bbls. from second Wilcox sand at 6,678-6,722 feet.

Marathon Oil Co.'s No. 2 Keefer, SW NW NW Section 5-13-3w, in the south end of the Edmond Pool, is a 1,000-bbl. well potentially from Wilcox sand at 6,660-6,720 feet. It is also good for 1,300,000 feet of gas.

Pure Oil Co. has made a location for No. 4 Malm, SW SE SW Section 30-14-3w, in the Edmond Pool. Larkin & Warr had rig up for No. 1 Military addition, NE cor. SW Section 34-12-3w, Oklahoma County.

Oklahoma

Estimated daily average production of Oklahoma for week ending November 2 and for the preceding week is as follows:

	Barrels	
	Nov. 2	Oct. 26
Allen	6,500	7,175
Asher-West Asher	1,025	1,025
Burbank	8,000	8,400
South Burbank	11,250	11,750
Balance Osage	24,000	24,225
Blackwell	4,750	4,775
Bristow-Slick	8,750	9,000
Chandler	4,225	4,600
Crescent	4,850	4,900
Cromwell	4,150	4,150
Cushing-Shamrock	12,500	12,800
Duncan district	4,325	4,575
Edmond	5,700	7,525
Fish	9,475	10,475
Fitts	33,375	30,225
Gray	1,775	1,800
Graham	5,550	4,100
Healdton	9,250	9,250
Hewitt	4,500	4,550
Holdenville	1,300	1,350
Keokuk	1,900	2,975
Konawa	1,700	1,725
Lucien	9,800	9,850
Marshall-Lovell	975	1,000
Oklahoma City	134,425	136,150
Papoose	1,200	1,200
Polo	3,325	3,350
Sasakwa and townsite	2,975	2,925
Sholem-Alechem	3,750	3,800
Seminole Field:		
Bowlegs	9,525	10,125
Carr City	4,275	5,960
Earlsboro	8,725	8,750
South Earlsboro	950	950
East Earlsboro	10,500	10,675
Little River	14,450	14,800
East Little River	900	875
Maud	1,275	975
Mission	2,850	2,950
Seminole	11,500	11,675
East Seminole	1,275	1,175
Searight	5,275	3,750
Total Seminole	71,500	72,660
St. Louis-Pearson	22,150	22,750
Tatums	4,250	4,400
Tonkawa-Garber-Thomas	5,800	5,800
Wewoka	3,600	3,650
Yale-Jennings	4,200	4,400
Other pools	55,600	56,590
Total Oklahoma	492,400	499,875

Greater Seminole Area

W. D. Grisso completed a 130-bbl. Booch sand producer in No. 1 Barnhart, 990 feet south and 884 feet east of NW cor. Section 8-6-8, Seminole County, at 2,735-56 feet.

Horman Oil Co.'s No. 1 Murphy, 320 feet north and 200 feet east of SW cor. Section 8-6-8, was completed. It is an 8-bbl. well from Gilcrease sand at 2,726-86 feet.

Blackwell Oil & Gas Co.'s No. 1 Harjo, NW cor. Section 34-8-7, Seminole County, was dry and abandoned at 3,300 feet.

Fleetborn Oil Co.'s No. 4 Stump, SW SE SW Section 27-8-8, Seminole County, swabbed 450 bbls. in 24 hours. It was completed in Wilcox sand at 4,220-40 feet.

Sinclair Prairie Oil Co.'s No. 1 Miller, NE NW SE Section 24-9-5, Seminole County, was dry and abandoned at 4,273 feet. It had been deepened from 4,248 feet.

Wood Oil Co.'s No. 1-A James, C W half NE SE Section 24-9-6, pumped 33 bbls. of oil and 200 bbls. of water from Hunton lime at 4,046-47 feet.

J. A. Hull's No. 1-A Taysche, C NE NW Section 25-9-6, flowed 1,000 bbls. of oil in 24 hours. It was cut 8 per cent with water. Hunton was found at 4,000-04 feet.

Sinclair Prairie Oil Co. deepened No. 4 Stout, NE SE NW Section 3-14-5, Lincoln County, from 3,468 feet to first Wilcox sand at 4,657-66 feet. It was dry and the well was abandoned.

Sinclair Prairie Oil Co. was rigging up machine for No. 7 Ralls, SE cor. NE SW Section 28-5-8, in the Allen district; Small and others rigging up No. 1 Gilman, CWL NW SW NW Section 28-5-8; O. H. P. Thomas, rigging up No. 5 Gilmore, NW cor. Section 28-5-8; Phillips Petroleum Co., rigging up to deepen No. 2 Weldfeldt, SE NW NW Section 2-7-4, in the St. Louis area; Magnolia Petroleum Co., location made for No. 1 Brandenburg-Jones, SW SE SE Section 7-7-4; Phillips Petroleum Co., deepening No. 1 Narcomy, SW SE SW Section 9-7-8, Hughes County, and testing at 2,994 feet; Sinclair Prairie Oil Co., a location for No. 2 Maxey, SE SW NW Section 1-8-6, Seminole County; Blackwell Oil & Gas Co., location for No. 1 Conner, NE NW SE Section 11-9-8; Sinclair Prairie Oil Co., cellar dug for No. 1 Kirley, NE SE NE Section 11-9-8; Magnolia Petroleum Co., set pipe at 84 feet in No. 2 Andrew, C E half NE NW Section 14-10-6, and a location for No. 3 Andrew, C W half NE NW Section 14-10-6; Ralvern Oil Co., rigging up rotary for No. 1 Camp, C NW NW Section 12-11-8, all in Seminole County; Art Thompson, drilling at 910 feet with a 100,000-foot gas showing in No. 1 Douglas, NE SE NE Section 22-12-13, Okmulgee County.

Tom Phillips' No. 1 Bynam, C S half SW NW Section 26-11-6, swabbed 357 bbls. in 76 hours, in four periods, and was then given a 1,000-gallon load of acid with a 100-bbl. oil load in Hunton lime at 4,124-51 feet.

Osage County

J. A. Freeberg and others abandoned their wildcat test in Osage County, NE cor. SE Section 1-25-6. It was a hole full of water at 3,108 feet. Mississippi lime was topped at 2,794 feet and it was drilled in lime until the water sand was uncovered at 3,100 feet.

Barnsdall Oil Co.'s No. 31, 300 feet north and 600 feet east of C Section 30-21-9, was junked and abandoned at 2,593 feet.

Sinclair Prairie Oil Co.'s No. 6, SE NW NW Section 15-24-7, was a 30-bbl. completion in Bartlesville sand at 2,496-2,547 feet. Same company's No. 8, SE NW SW Section 15-24-7, started at 37 bbls. a day from Bartles-

ville sand at 2,478-2,568 feet. It was completed.

New work started in Osage County included Sinclair Prairie Oil Co.'s No. 1, NE NE SW Section 9-25-6, location; Sinclair Prairie Oil Co.'s No. 6, SE SW SE Section 9-25-6; location; Sinclair Prairie Oil Co.'s No. 4, SE SE NE Section 16-25-6, cellar; Sinclair Prairie Oil Co.'s No. 11, NE SW SW Section 30-25-8, location; Morrison & Alexander's No. 4, NE cor. SE Section 35-25-11, drilling below 500 feet; Peters Petroleum Corp. and Norbla Oil Co.'s No. 1, NW cor. SE Section 27-23-9, location; Bay Oil Corp.'s No. 2, NW cor. NE NW SW Section 25-22-7, rig; E. O. Platter and I. T. I. O. Co.'s No. 7, SE cor. SW SE NW Section 30-22-9, drilling at 150 feet; Sinclair Prairie Oil Co.'s No. 9, 990 feet south and 835 feet from west lines of Section 15-24-7, digging cellar; same company's No. 8, 990 feet from south and 835 feet from west lines of NW quarter Section 15-24-7, cellar; Lewis Production Co.'s No. 1, SE cor. NE Section 20-24-7, cellar.

Barnsdall Oil Co. got a 10,000,000-foot gas production from Wilcox sand at 1,820-22 feet in No. 6, NW cor. SE Section 10-21-12, and the well was shut in for orders.

Lewis Production Co.'s No. 7, NW cor. SW Section 21-24-7, Naval Reserve Pool, flowed 300 bbls. in 24 hours after the hole was cleaned out following a 40-quart shot at 2,664-82 feet.

Peters Petroleum Corp. and Sinclair Prairie Oil & Gas Co.'s No. 9, 990 feet from north and 840 feet from west lines of NE quarter Section 24-24-7, drilled to Siliceous lime at 2,737 feet, total depth 2,818 feet. The well flowed 163 bbls. the first nine hours and 92 bbls. a day on a later test.

Peters Petroleum Corp. and Oliphant's No. 9, 1,065 feet north and 1,310 feet west of C Section 32-24-9, had Hominy-Wilcox sand at 2,480 feet and oil at 2,482-83 feet. It flowed 412 bbls. of oil in 12 hours and later 10 bbls. per hour pinched in.

Barnsdall Oil Co.'s No. 2, SW cor. NW SE Section 23-24-10, swabbed 42 bbls. of oil in six hours and was shut down for tankage. Bartlesville sand lay at 1,795-1,858 feet, total depth.

In the South Burbank Pool, Carter Oil Co. and others' No. 4 M. J. Cook, 25 feet from east and 990 feet from north lines of NE quarter Section 9-25-6, had Bartlesville sand at 2,670 feet, total depth 2,736 feet. The well flowed 155 bbls. the first hour and 1,980 bbls. in 24 hours and was shut in. Same operators' No. 8 V. Presbury, 1,295 feet from north and west lines of NE quarter Section 10-25-6, flowed 753 bbls. the first day, 1,051 bbls. the second and 1,042 bbls. the third from Bartlesville sand at 2,671-2,767 feet, total depth. Same operators' No. 10 Mead Denoya, 25 feet from east and 1,295 feet from south lines of SW quarter Section 10-25-6, flowed 1,822 bbls. the first day and 1,968 bbls. the second from Bartlesville sand at 2,792-2,898 feet, base of the sand. These wells are in the communitized block which is being operated on the most modern system of repressuring the sands through the introduction of gas into key wells, the gas coming from the wells in the block.

Roger Mills County

Roger Mills, a western Oklahoma border county, is to have a test for oil in Anderson & Kerr and others' No. 1 Teeter, C SE SE Section 2-17-25w, for which location was staked.

Noble County

Skelly Oil Co.'s No. 2 Hannah, SE SW SW Section 22-22-2w, in the Polo Pool, Noble County, flowed 897 bbls. in 18 hours while drilling. Viola lime was topped at 4,778 feet and Simpson dolomite at 4,876 feet and Wilcox at 4,905 feet. It was producing from all three formations.

In the Lucien Pool, Carter Oil Co.'s No. 2 Pfeiffer, 390 feet from south and 660 feet from west lines of SE quarter Section 33-20-2w, flowed 140 bbls. a day at a total depth of 5,098 feet, and drilling.

Stanolind Oil & Gas Co.'s No. 2 Kolb, 385 feet north and 660 feet west of C Section 33-20-2w, swabbed 437 bbls. in 24 hours from Wilcox sands, total depth 5,157 feet.

Payne County

The second producing well in the new Stillwater Pool in Payne County, Amerada Petroleum Corp. and Stanolind Oil & Gas Co.'s No. 1 Jones, SW cor. Section 27-19-3, had Wilcox sand at 4,310-16 feet, total depth. It flowed 525 bbls. in 10 hours and 10 minutes and was then shut in for pipe line connection.

Logan County

Springrose Drilling Co. and others have material in for a test on the Cole farm, SW cor. NW Section 32-15-1e, Logan County.

Grady County

Sayre Oil Co.'s No. 1-A Brooks, NE NE SE Section 36-4-6w, Grady County, was dry and abandoned at 3,000 feet.

H. R. McKnight made a location for No. 1 Willis, a wildcat, NE SE NE Section 26-5-7w.

Southern Fields

Prince Brothers' No. 1-A Williams, C SW SE Section 19-2n-8w, Stephens County, had a water sand at 2,450-54 feet, and was abandoned at 2,505 feet.

Coline Oil Co.'s No. 15 Willis, near C NE NE SE Section 6-4s-3w, Carter County, is a 25-bbl. completion at 1,112-1,265 feet.

Schermerhorn Oil Co.'s No. 11 Frazier, NW NE SW SW Section 15-4s-3w, was abandoned at 1,362 feet, after passing through water sands all the way from 148 feet to the bottom, with an oil showing at 1,125-35 feet.

Phillips Petroleum Co. made location for No. 4 Tucker, 850 feet from the north and 200 feet from east lines of NW quarter Section 29-2s-3w. The company announces that this test is for a shallow gas well.

Jones and others made a location for No. 1 Edwards, C NW NW SE Section 27-3s-6w, in northern Jefferson County. Cullum & Perkins' No. 6 Smith, SW cor. NE SE SE Section 34-1s-10w, Cotton County, was being cleaned out after shooting sand at 2,178-90 feet. C. A. Yoakum had rig and tools on the ground for No. 1 Hunter, SE cor. NE Section 9-3s-13w, a wildcat in Cotton County. G. W. Scheig and others made location for No. 1 Fox, NW SW NW Section 13-1-20w, Jackson County. Twin State Oil Co. made location for No. 1 W. W. Bassett, NW SW SW Section 16-5s-7w, Jefferson County, a wildcat.

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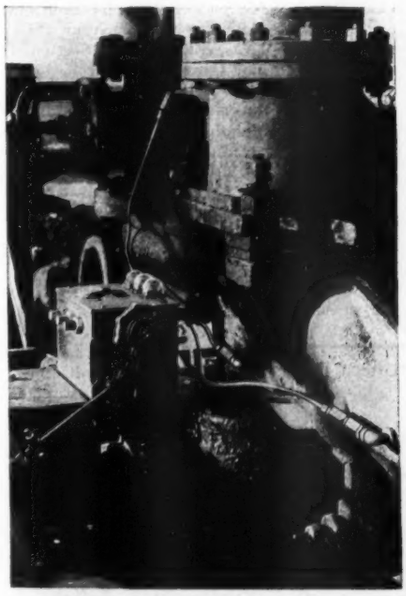

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Kansas Developments

By JAMES McINTYRE

OXFORD POOL'S POTENTIAL IS RATED 235,897 BBLS. PER DAY

State proration officials in Kansas give the potential production of the deep pay in the Oxford Pool in Sumner County, as 235,897 bbls. from 23 wells. The pool is permitted to produce only a modicum of this as all the wells, deep and shallow, produced last week only 9,275 bbls. per day. The wells are permitted to produce 4.08 per cent of their potential, but as new wells come in the allowable production is subject to change. A recent round up of the field shows the Lario and Barnsdall companies with a potential of 44,099 bbls. from five Dolomite wells on the Emrich lease; Amerada Petroleum Corp., 117,908 bbls. from seven wells on the Gassaway lease; Shell Petroleum Corp. with 64,999 bbls. from the five wells on the Rothwell lease; 4,116 bbls. from two wells on the Emrich lease; 587 bbls. from one well on the Buffington property, and 4,188 bbls. from three Scroggins farm deep sanders, a total for the Shell of 73,890 bbls. from 11 Dolomite wells. The potential production of the whole state is estimated at 793,605 bbls. in 21 hours from 19,836 wells. Of course potential production figures in any state would very soon be materially shaved down if all the wells were permitted to produce their capacity, but notwithstanding this, it is safe to say that Kansas can produce much more oil than ever before in its history and when the score or so of pools now without pipe line connections are provided with an outlet the state will without doubt further increase its potential oil supply.

Kansas

The estimated daily average production of Kansas for the week ending November 2 and for the preceding week follows:

	Barrels	
	Nov. 2	Oct. 26
Oxford City	9,275	8,500
Burrton	15,875	15,775
Ritz-Canton	8,325	8,000
Hollow	3,075	3,425
Voshell	3,475	4,325
Nikkell	2,760	2,675
Ellsworth County:		
Lorraine	11,175	10,325
Other pools	1,850	1,845
Rice County:		
Chase	12,425	12,775
Raymond	2,420	3,300
Stockel	2,975	3,450
Keesling	2,105	1,523
Other pools	3,250	3,802
Russell County:		
Fairport	3,762	2,985
Gorham	3,039	3,100
Russell	2,160	2,430
Other pools	2,400	2,950
Sedgwick County	6,750	6,900
Barton County	2,300	2,560
Ellis County	260	550
Kingman County	922	720
Stafford County	1,365	1,780
Greenwood County	10,850	10,850
Butler County	17,750	17,750
Other fields	19,339	18,635
Total Kansas	149,925	150,950

Sumner County

In the Oxford Pool, Amerada Petroleum Corp. and Sunray Oil Co. added another to the pool's list of big completed wells, their No. 14 Gassoway starting at 27,206 bbls. per day from Dolomite at 2,800-89 feet. The well had been acidized. It produced 2,388 bbls. in nine and half hours before the acid treatment. The location is 661 feet from south and 200 feet from east lines of SW ¼ of Section 14-32-2.

Shell Petroleum Corp.'s No. 5 Emrich, 1,002 feet south and 212 feet east of center Section 14-32-2 started at 2,966 bbls. in 24 hours from Dolomite at 2,828-2,906 feet. It was acidized with 12,000 gallons in two treatments and was completed.

Slick-Urschel Inc. and others made a location for No. 5 Peasel, C north half, north half NW Section 33-31-1w. Derby Oil Co. was moving in rotary for No. 1 Reitz, 218 feet from N line and 1,115 feet from west lines of SW ¼ Section 25-31-2 to deepen from 1,892 feet.

Rice County

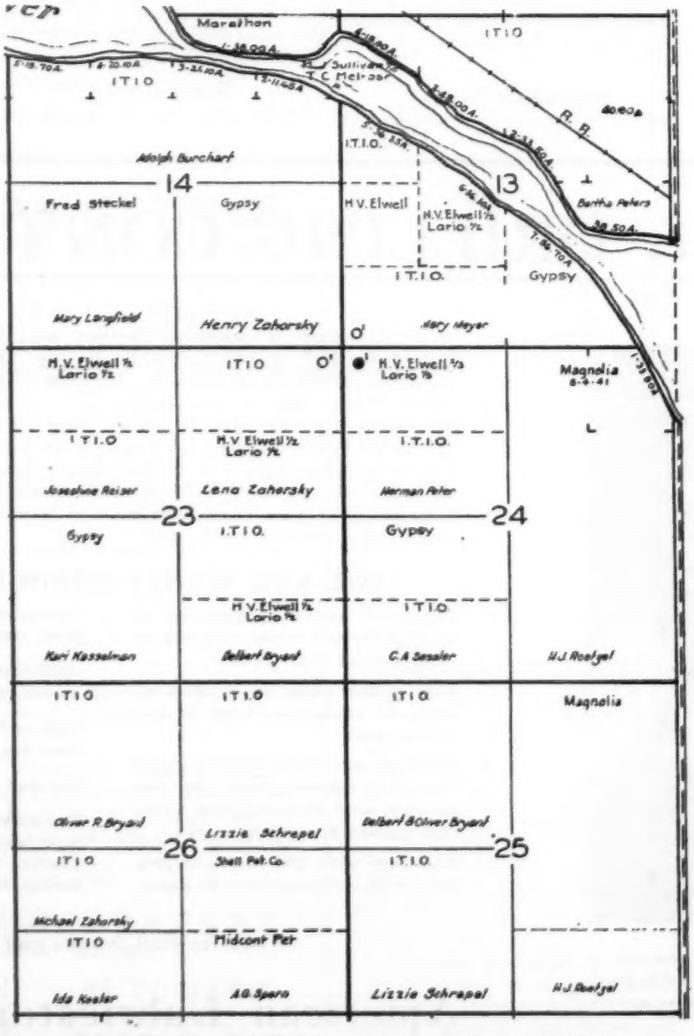
Tatlock and others' No. 1 Berscheit, NW cor. Section 6-20-10w, Rice County, found Siliceous lime at 3,278-3,301 feet, and after an acid treatment made 1,450 bbls. of oil on its completion test.

Gypsy Oil Co. got a 1,350-bbl. initial producer in No. 3 Smith, SE NE NE Section 16-20-9w from Siliceous lime at 3,215-26 feet. Same company completed a 1,665 bbl. well in No. 4 Smith, SE SE NE Section 16-20-9w in Siliceous lime at 3,224-26 feet.

Anderson & Kerr's No. 1 Wernet, NW cor. Section 24-20-6w, a wildcat, was abandoned after the hole filled with water from Wilcox sand at 3,636-47 feet.

Stanolind Oil & Gas Co. made location for No. 3 Mitchell, 1,470 feet north and 232 feet east of SW cor. Section 32-19-10w; Sinclair Prairie Oil Co., cellar dug for No. 2 Graham, SE SW SE Section 16-20-10w; Phillips Petroleum Co., location for No. 7 Mezger, NE NW NE Section 21-20-10w; Gypsy Oil Co., building rotary rig for No. 3 Hartle, SE NW NW Section 15-20-9w; Mid-Continent Petroleum Corp., moving in material for No. 4 Hartle, SE SW NW Section 15-20-9w.

Sinclair Prairie Oil Co.'s No. 8 Volkland, NW SW SE Section 20-19-9w, had Siliceous lime at 3,229-52 feet. It swabbed 7 bbls. per hour.



Lario Oil & Gas Co. and Elwell open pool in Section 24-20-11w, Barton County. The well pumped 220 bbls. in 4½ hours

(Copyrighted by Mid-Continent Map Co., Wichita.)

Russell County

Hartman & Blair's No. 1 Claussen, SE NE SW Section 34-12-14w, Russell County, a wildcat, was a hole full of water at 3,122 feet, total depth, and was abandoned.

Alexander & McCole's No. 1 Baier, SE cor. Section 34-13-15w, was acidized in Siliceous lime at 3,324-31½ feet and produced 212 bbls. of oil and 118 bbls. of water in 24 hours.

Empire Oil & Refining Co.'s No. 5 Ehrlich, 181 feet from north and 988 feet from east lines of SE quarter Section 28-13-14w, produced 1,351 bbls. of oil and over 200 bbls. of water from Siliceous lime at 3,278-83 feet, which had not been acidized.

Bridgeport Machine Co.'s No. 3 Mills, SE SE NE Section 4-14-15w, had Oswald lime at 3,045-3,117 feet, with pay at 3,070-78 feet, and produced 295 bbls. of oil naturally in 24 hours.

Palmer Oil Corp. has rig up for No. 1 Killian, SE SW NE Section 28-13-14; Stanolind Oil & Gas Co. is moving in material for No. 21 Benso, NE SW SW Section 4-14-15w.

Ellsworth County

Twin Drilling Co., which opened the Lorraine Pool last year, completed No. 3 Rolfs, NE NW SW Section 13-17-9w, in the pool named. It produced 1,054 bbls. of oil and 300 bbls. of water in 24 hours from Siliceous lime at 3,212½-14 feet.

Carter Oil Co. and others, discoverers of the Teubner, or South Lorraine Pool, completed No. 3 Teubner, 1,320 feet from west and 440 feet from south lines of NW quarter Section 26-17-9w. It produced 1,371 bbls. naturally in 24 hours from Siliceous lime at 3,173-82½ feet.

Empire Oil & Refining Co. was moving in material for No. 1 Dolchek, SW SW SW Section 7-16-7w; Davis, Winkler & Koch, cellar dug for No. 7 Melchert, NE NE NE Section 23-17-9w; Texas Co., cellar dug for No. 7 Dees, NW SW NW Section 23-17-9w; Carter Oil Co. and others, cellar dug for No. 2 Ogden, 440 feet

south and 1,320 feet W of C Section 26-17-92; Carter Oil Co. and others, cellar dug for No. 2 Williams, C W half W half NE Section 26-17-9w.

Texas Co.'s No. 1 Becker, NE NE SE Section 26-17-10w, Ellsworth County, had Siliceous lime at 3,250-65 feet and pumped 297 bbls. the first 24 hours and then pumped 7 bbls. of oil per hour with a water showing.

Empire Oil & Refining Co. will make a water disposal well of No. 12 Rolfs, NW NE NE Section 14-17-9w, which was practically a failure as an oil well, the oil production having been drowned out by water.

Barton County

C. L. Price and others' wildcat test, No. 1 Ehrlich, NW NW SE Section 10-16-13w, Barton County, was abandoned at 3,375 feet, a hole full of water, from Siliceous lime topped at 3,356 feet.

Magnolia Petroleum Co.'s No. 1 Steckel, SE SW NE Section 1-20-11w, in the Steckel Pool, swabbed 135 bbls. in 13 hours from Siliceous lime at 3,279-87 feet, and the hole then filled 800 feet with oil in 45 minutes.

Lario Oil & Gas Co.'s No. 1 Peter, NW cor. Section 24-20-11w, was acidized in Siliceous lime at 3,273-91 feet, and pumped 220 bbls. of oil in 4½ hours.

Rush County

Marathon Oil Co. made location for No. 1 Mauler, C SW Section 12-18-16w, Rush County.

Cowley County

Joe Aylward's No. 1 David, SW SW SE Section 35-30-4, Cowley County, made a potential production of 269 bbls. in 24 hours from sand at 2,980-97 feet, and was completed.

Lloyd, Frost & Study had cellar dug for No. 2 Weathered, SE SW SE Section 28-31-3. Roth & Faurot were building rig for No. 1 Sherwood, NE NW SW Section 11-31-4, a wildcat.

Stafford County

Stanolind Oil & Gas Co.'s No. 1 Komarek, NE cor. Section 30-22-11w, Stafford County, was completed in Siliceous lime at 3,570-84 feet. It made a potential of 927 bbls. in 24 hours.

Atlantic Oil Producing Co. and Phillips Petroleum Co.'s No. 1 Cornwell, a wildcat in C NE SW Section 4-25-13w, was dry and abandoned at 4,270 feet. Siliceous lime was topped at 4,242 feet.

Greenwood County

Shaffer & Howell's No. 2 Sauder, 380 feet from north and 250 feet from east lines of SE quarter Section 16-23-13, Greenwood County, is a 65-bbl. completion at 1,745-57 feet.

C. Sheedy's No. 1 Klick, NW SE SW Section 20-25-14, Woodson County, made a 170-bbl. initial production from sand at 1,390-1,450 feet.

Mid-Continent Petroleum Corp. made location for No. 12 Shadel, 923 feet from north and 300 feet from west lines of SW quarter Section 15-23-13. Sheedy and others, rigging up machine for No. 6 Atkins, C E half NE SW Section 19-25-14e, Woodson County.

Sedgwick County

Dickey Oil Co. was building rotary rig for No. 1 Wilbur, a wildcat, in SW SW SW Section 15-27-1w.

McPherson County

Tom Palmer and Sinclair Prairie Oil Co.'s No. 4 Anderson, NE cor. Section 31-18-2w, McPherson County, was acidized in Kansas City lime at 2,301-23 feet and made a four-day average of 124 bbls. per day. It was completed.

Carey & Miller's No. 1 Husband, SE SE NW Section 6-19-3w, a wildcat, was abandoned. It had a hole full of water from Siliceous lime at 3,754-58 feet, total depth.

Imo Oil & Gas Co. and others were moving in material for No. 2 Sperling, NE NE NE Section 23-22-2w. Ok-Tex Oil Co. was building rig for No. 1 Osborne, C SE SE Section 6-23-3w, Harvey County.

Butler County

Phillips Petroleum Co.'s No. 8 Neer, C NW NE Section 29-23-4, Butler County, is a 25-bbl. completion at 1,975-2,104 feet.

Vickers Petroleum Co.'s No. 1 McCraner-A, 660 feet north and 440 west of SE cor. Section 35-24-3, made a four-day average production of 268 bbls. per day from Mississippi lime at 2,715-23 feet. It made 300 bbls. the first day. Same operator's No. 2 McCrane-B, 660 feet from south and 440 feet from east lines of SW quarter Section 36-24-3, was also completed. It made a potential production of 78 bbls. from Mississippi lime at 2,684-2,703 feet.

Palmer and others' No. 1 Ellis, a wildcat, in NE cor. Section 7-25-4, was dry and abandoned at 2,751 feet.

Mohawk Oil Co.'s No. 1 Overstreet, NW cor. Section 19-26-8, is a 100-bbl. completion at 2,058-67 feet.

Aladdin Petroleum Co.'s No. 3 Klinger, C SW NE Section 24-27-3, made a four-day average of 119 bbls. per day on its completion test, from pay at 2,265-69 feet (Kansas City lime).

Empire Oil & Refining Co.'s No. 33 Love, SE NE NW Section 29-28-4, is a 55-bbl. well at 2,505-16 feet.

H. B. Garden was drilling at 750 feet in No. 6-B Sluss, C W half NW NW Section 6-27-6.

Reno County

Allison & Fitzwilliams' No. 1 Dukelow, NE cor. Section 11-22-6w, a wildcat in Reno County, was dry and abandoned at 4,285 feet. Siliceous lime was topped at 4,181 feet.

Gypsy Oil Co.'s No. 4 Myers, C NE NW Section 3-24-4w, Burrton area, produced 52 bbls. of oil and 5 bbls. of water from Chat at 3,274-3,325 feet and was completed.

Sinclair Prairie Oil Co. moved in material for No. 1 Seedle, SE SE NE Section 17-24-4w.

Pratt County

Lario Oil & Gas Co., Atlantic Oil Producing Co. and Elwell made a location for a wildcat test in SE SE NW Section 12-29-13w, Pratt County.

Barbara Oil Co. deepened its No. 1 Angell, C NE NE Section 23-33-13w, Barber County, from 4,923 feet.

Marathon Oil Co. made a location for No. 1 Zellers, C SW NW Section 17-35-8w, Harper County, 1,160 feet north of the Oklahoma state line.

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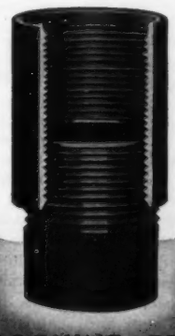

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Michigan Field Report

BEST WEEK IN COMPLETIONS AND NEW PRODUCTION PEAK

By
PAUL A. ELLIOTT

MUSKEGON, Mich., Nov. 4.—Averaging more than 54,300 bbls. a day, Michigan fields established a new peak of about 1,684,000 bbls. during October and pushed the 10-month total to approximately 12,874,000 bbls., or 21 per cent more than the 10,600,000 bbls. produced during all of 1934.

Last week was one of the biggest in completions for several months with about 10,000 bbls. potential. Included among the 23 completions were 14 new wells in the Crystal Field, four gas wells and five dry holes.

New Wildcat Producers

Outstanding among the completions was a wildcat in Larkin Township, Midland County, which struck oil in probable commercial quantities in the comparatively shallow Berea formation, heretofore produced principally in Saginaw County fields. After striking a show of oil in the Berea the previous week, Riverside Oil & Gas Co., or Karl K. Leibrand, trustee's No. 1 State, C NE NE Section 32-15n-2e, Larkin Township, swabbed 25 to 30 bbls. a day and was estimated good for 50 to 75 bbls. a day when cleaned out.

The Berea was topped at 2,483 feet and the well came in at 2,497 feet. The hole filled 700 feet naturally before a shot which boosted the fluid to 2,000 feet. Berea is the highest grade crude produced in Michigan. Development of a possible commercial well in this test about 3 miles north of the city of Midland is the sixth wildcat strike in Michigan during the past two or three months.

Another upper Traverse well which aroused interest is Brehm and Bond's No. 1 William Gould, Section 19-15n-2w, Geneva Township, Midland County, which was increased by acid treatment to 200 bbls. a day after an initial flow of 105 bbls. an hour had been shut off by water. It was reported still making about 20 bbls. of water with 200 bbls. of oil last week after drillers attempted to shut off the water before treating.

Jetter and Lima Oil companies' No. 1 C. N. Long, SW NW SE Section 1-9n-6w, Bushnell Township, Montcalm County, struck a good show of oil in the upper Traverse on its way to the Dundee into which the hole probably will be drilled this week.

Largest Gas Well

Michigan's largest gas well was brought in Sunday when Michigan Exploration Co.'s No. 1 William J. Richardson, SW SW NE Section 3-12n-7w, Belvidere Township, Montcalm County, struck an open flow of 40,000,000 feet daily, 35 feet in the Michigan Stray sands. The well had been drilled about three or four times the average depth in the shallow Michigan sands because it was to be carried to the Dundee oil sand as a deep test. Its record flow exceeded the previous largest gasser brought in about two years ago in the Austin Township, Mecosta County Field by Taggart Brothers for an open flow of about 34,000,000 feet and boosted the aggregate potential of the Millbrook-Hinton-Belvidere Townships Field on the line between Mecosta and Montcalm Counties well over 300,000,000 feet daily.

Crystal-Montcalm

Pure Oil Co. brought in a large well in the Crystal Township, Montcalm County Field, when No. 3 H. S. and C. D. Preston, SW SE NE Section 3-10n-5w, flowed at the initial rate of about 8,000 bbls. daily from the Dundee and was given a rating of 5,000 bbls. potential under 420 pounds back pressure. Dundee limestone was topped at 3,162 feet and the pay at 3,167 feet, or about 16 feet higher than the field average. It flowed 360 bbls. an hour at the start.

Stork Oil Co.'s No. 6 G. Dickenson, SW NW SE Section 3, same township, originally produced from the upper Traverse making 15 bbls. an hour, was deepened into the Dundee and increased to 68 bbls. an hour. It was completed at 3,198 feet.

Daily Crude Oil Co. completed two Dundee producers in Crystal Township, one for 500 bbls. and the other for 300 bbls. initial. The larger was No. 3 W. Robbins, NE NW NE Section 3, which topped the limestone at 3,175 feet and was completed 20 feet in, or at 3,195 feet. No. 2-A J. Tow, SW SE SE, same section, entered the Dundee at 3,184 feet and finished drilling at 3,196 feet.

An unexpected initial flow of about 400 bbls. a day was encountered in the upper Traverse by Gordon Oil Co.'s No. 4 William E. Strait, NE SE NW Section 3. The upper limestone was struck at 2,715 feet and the well flowed at 2,776 feet. It made 20 bbls. an hour but will be carried to the Dundee if production does not hold up.

J. W. Leonard, Jr., trustee's No. 4 C. R. West estate, NW SE SW Section 2, came in with a potential of 185 bbls. a day in the Dundee topped at 3,166 feet and drilled to 3,191 feet.

Ferris-Montcalm

Two tests were completed in the Ferris Township section of the Crystal Field. The Warren Oil Co.'s No. 1 Warren estate, SW SE NW Section 26-11n-5w, Ferris Township, made 400 bbls. a day when completed in the Dundee at 3,247 feet. It was originally estimated good for 700 bbls. bbls. but dropped to 400 bbls. and later experienced trouble due either to caving or water encroachment.

Eastern Gulf Oil Co.'s No. 1 E. Conner, NW NW NW Section 35, was dry striking bottom water at 3,232 feet and finishing at 3,276 feet.

Nine other tests in the Crystal Field, including six in Crystal Township and three in Ferris, were nearing early completion in the Dundee. Two new tests are attracting interest, one because it is within the Crystal village limits and the other because it is the first test in Section 5, Crystal Township. The former is E. H. Linabury's No. 1 Frost, SE SE SE Section 8, and the latter is Jetter Oil Co.'s No. 1 Pitcher, SE NW Section 5.

Midland County

Pure Oil Co.'s No. 6-A John H. Miller, NE SW SW Section 17-13n-1w, topped the Dundee at 3,358 feet and was completed at 3,377 feet for an initial of 60 bbls. an hour. Carter Lease, Inc.'s No. 8 William Maywood Carter, NW SE SW Section 18, made 15 bbls. in the first 20 minutes but will be treated before given a test. Dundee limestone was topped at 3,413 feet and drilling finished at 3,434 feet. It is estimated it will make at least 500 bbls. a day. No. 1 A. E. and Nellie L. Hill test, SE SE SE Section 8, which had a hole full of oil at 3,432 feet, or 21 feet in the Dundee, the week before last, made about 50 bbls. a day after treatment. It was completed by Ladd, Lush and Knight, successors to L. T. Baker, trustee.

Millbrook Gassers

L. F. White, trustee's No. 1 Bellows, C SW NW Section 10-12n-7w, Belvidere Township, Montcalm County, struck an open flow gauged at 17,400,000 feet a day, 9 feet in the Michigan Stray sands at a total depth of 1,254 feet. It is a diagonal offset to the previous record-holding Jones-Wilson 17,000,000-foot well.

Prudential Oil & Gas Corp.'s No. 1 Eva Pearl Braley, C NE NE Section 4, Belvidere Township, had an open flow of 11,000,000 feet a day in the Michigan Stray sands. The formation was topped at 1,244 feet and well completed at 1,255 feet. Edward Stewart's No. 1 Alpha Cogswell, C NW NE Section 32-13n-7w, Millbrook, made about 10,000,000 feet when drilled to the unusual depth of 24 feet in the Michigan Stray sands. Refiners Petroleum Corp.'s No. 1 Clark R. and Ina Miller, C SE SW Section 34, Millbrook Township, gauged at 4,800,000 feet from the Michigan Stray sands at 1,240 feet and drilled to 1,279 feet. Michigan Exploration Co., Inc.'s No. 1 William J. Richardson, SW SW NE Section 3, Belvidere Township, struck a flow of 7,000,000 feet but will be drilled to the Dundee for oil.

Isabella County

A deep test for oil has been started by the Pure Oil Co. on its Mosner-McClintic lease, SW NW Section 15-14n-9w, Broomfield Township, Isabella County.

A show of gas and oil was struck in the Dundee by T. T. Hawksworth in No. 1 Dimon, NW SW NW Section 34-15n-3w, Denver Township. First signs of production at 3,581 feet.

Saginaw County

Smith Petroleum Co., of Saginaw, added a 10-bbl. Berea well in the Birch Run Township, Saginaw County Field in its Gray-Ackerman Community Lease well, NW NE SE Section 20-10n-6e.

Ogemaw County

The uncertainty of Traverse limestone production was demonstrated in Mills Township, Ogemaw County, when the first offset to Fortney Oil Co.'s No. 1 State well, which has made more than 75,000 bbls. in the lower Traverse, was drilled in. Melling Oil & Gas Co.'s No. 2 L. Roma, SW NW NW Section 6-21n-3e, for a while made 10 bbls. an hour when drilled into the same pay at 1,810 feet after topping the upper Traverse limestone at 1,685 feet. But it was later drowned out with water and there was doubt whether it could be completed as a commercial producer at this depth. If not, it will be drilled to the Dundee.

Average daily production of about 60 bbls. was reported from the Capitol Oil & Gas Co.'s No. 1 Country Club, SW SW SW Section 20-22n-2e, West Branch Township, after acid treatment.

Lower Traverse was struck in Charlotte G. Marsh, trustee's No. 1 State, NW NE SW Section 6, Mills Township, at 1,970 feet and the hole filled about 1,200 feet with oil when operations were stopped 4 feet in.

Gratiot County

Although two dry holes were completed in Gratiot County wildcat tests, three locations were announced. Both "dusters" were drilled by St. Louis Pipe & Supply Co. No. 1 John Longenbach, SE NE SE Section 10-12n-2w, Bethany Township, and No. 1 Northwestern Mutual Life Insurance Co., NE NE SW Section 25-12n-4w, Seville Township. The new tests were Arbaugh and Ellis' No. 1 Gould, SW SW SE Section 34-11n-4w, Sumner Township; Charles E. Weller's No. 1 Milton P. Saxon, SW SW NW Section 28-9n-3w, Fulton Township, and T. F. Caldwell, Inc.'s No. 1 William Brannon, SW NW NE Section 6-9n-4w, North Shade Township.

Another failure was recorded in Lapeer County when salt water was encountered in Kinnekenik Land Co.'s No. 1 James and Harry Watson, SE NW SW Section 17-8n-11e, Arcadia Township, about 12 feet in the Sylvania.

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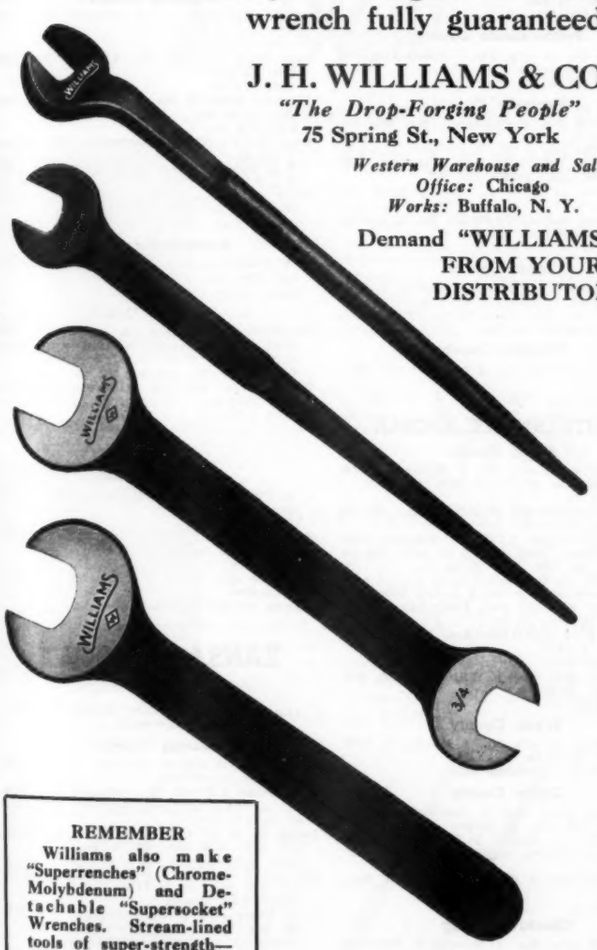

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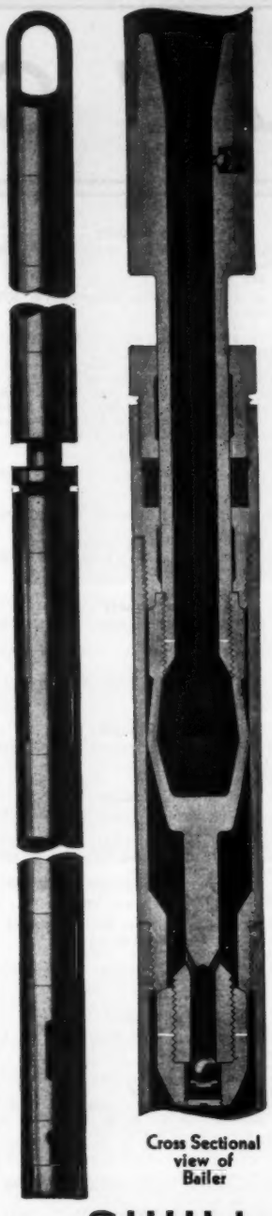

Cross Sectional view of Bailer

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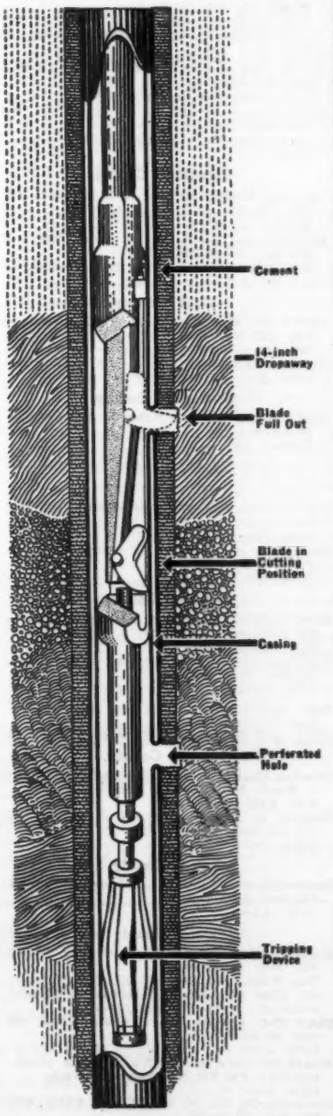

View of Perforator in collapsed position, with dotted lines showing blade in cutting position.

WILDCAT OPERATIONS

OKLAHOMA WILDCATS

Week Ending November 2

NORTHERN OKLAHOMA

Alfalfa County

Marathon Oil Co.'s No. 1 Werner, NW NW SW Sec. 18-29-9w. Location.

Tex-O-Kan Oil Co.'s No. 1 Acre, C SW NE Sec. 14-24-11w. Lost circulation at 6,622 ft.; cemented with 250 sackfuls, drlg. at 6,475 ft. in new hole.

Beaver County

Anderson & Kerr et al's No. 1 Davis, C SW SE Sec. 26-5-26 (Cimarron Meridian). Dolomite 2,970-90 ft.; sand 2,990-3,010 ft.; lost circulation; cemented.

Beckham County

G. E. Martin's No. 1 Hood, C NE NW Sec. 7-8-23w. Drlg. 2,202 ft.

Star Oil Co.'s No. 1 Blair, C NW SE Sec. 22-9-26w. Rig and tools.

Caddo County

Denver Prod. & Ref. Co.'s No. 1 Sah-Can, C SE SE Sec. 33-10-10w. T.D. 8,230 ft.; salt wtr.; P.B. to 6,600 ft., back in old hole, circulating at 8,100 ft.

H. W. Lee et al's No. 1 Horton, NE cor. Sec. 9-6-13w. T.D. 1,400 ft.; fishing for bailer.

F. A. Turner et al's No. 1 Sapin, NE NE SW Sec. 1-5-11w. T.D. 3,166 ft.; U.R. to 5-3/16-in. csg. to 3,118 ft.

Cleveland County

Asa Lee Mayes, Inc.'s No. 1 Parsons, SW SW SE Sec. 30-9-1. Moving in tools.

Hall-Briscoe, Inc.'s No. 1 Fant, SW SW NE Sec. 27-10-2w. T.D. 6,830 ft. in Hunton lime; cemented off 655 ft. of drill pipe; drlg. 6,732 ft.

Coal County

Carter Oil Co. et al's No. 1 Thompson, C S½ NE NW Sec. 34-2-9. Woodford 5,630 ft.; Hunton 5,735 ft.; Sylvan 5,881 ft.; Viola 5,970 ft.; T.D. 6,002 ft., waiting for cement to set.

Comanche County

Oscar Jones' No. 1-A Scheets, NE SW Sec. 26-3-10w. **Rigged up.**

F. B. Imboden et al's No. 1 Smith, SW cor. 12-2-10w. Show of oil at 230-38 ft.

John Nicholas' No. 1 Householder, NE NE SW Sec. 8-2-10w. Drlg. 790 ft.

Geo. Pace et al's No. 1 Spencer, SW cor. SE Sec. 21-3-10w. Drlg. 450 ft.

Garfield County

Ross Cummings et al's No. 1 Gage Est., SE NW Sec. 27-22-3w. **R.U. cable tools.**

Herndon Drlg. Co. et al's No. 1 Whitaker, SE cor. Sec. 27-24-3w. Drlg. 3,475 ft.

Earl McBride's No. 1 Gage, SE SE NW Sec. 27-22-3w. T.D. 610 ft.; ran 12-in. pipe; S.D.

Garvin County

Charles Carter and W. S. Key, Inc.'s No. 1 Wood, NW SW SE Sec. 5-4-3e. **S.D. 2,495 ft**

Suggett & McElreath's No. 1 Camp, NE NE SE Sec. 22-4-1w. Drlg. 2,880 ft.

Grady County

Sayre Oil Co.'s No. 1 Anderson, NE SE SE Sec. 34-4-6w. Drlg. 2,700 ft.

Grant County

Helmerich & Payne's No. 1 Crouse, C NE SW Sec. 29-25-8w. Top Wilcox 6,615 ft.; T.D. 6,684 ft.; shot off pipe at 4,443 ft.; flowed mud and some oil; trying to pull casing.

Shell Pet. Corp.'s No. 1 Foster, NW SE Sec. 20-27-4w. Drlg. 5,592 ft.

Wentz Oil Corp. et al's No. 1 Wirtz (Community), SE SE NW Sec. 22-23-4w. Drlg. 3,710 ft.

Southern Oil Co. et al's No. 1 Allen, SW SE Sec. 36-26-4w. Rigging up rotary.

Greer County

H. N. Payne et al's No. 1 Tressell, NW cor. Sec. 1-7-22w. **T.D. 1,785 ft.; U.R. 8-in. csg.; to deepen; cleaning out.**

Hughes County

Caprock Oil Co.'s No. 1 Parks, SW SW SE Sec. 34-7-8. **S.D. 300 ft.**

Sivalls et al's No. 1 Montgomery, NW SW NW Sec. 7-9-9. Drlg. 1,510 ft.

Texas Co.'s No. 1 Keaton, NW SW Sec. 4-8-10. **Set 8-in. csg. 3,950 ft.; shot 15 qts. 3,-935-4,038 ft.; acidized; 650 ft. oil and 1,-250 ft. water in hole; pulled 8-in. csg. and plugging back to 3,988 ft.; acidized with oil load, flowed 50 bbls. oil gross in one head, then "went dead."**

Kay County

Helmerich & Payne's No. 1 Roth, SW SW SW Sec. 8-28-2w. Bldg. rig.

A. D. Morton's No. 1 Warren, SE SE NW Sec. 19-29-4. T.D. 1,490 ft.; wtg. for casing.

Robinson Drlg. Co.'s No. 1 Hermes, SW SW NW Sec. 6-26-4. Drlg. 3,847 ft.

Kiowa County

Rajah Oil Co.'s No. 3 Stone, C SE NE Sec. 34-7-17w. Salt water 1,480-1,547 ft., T.D.; plugging back.

Regan Oil Co.'s No. 1 King, SE SE NW Sec. 11-6-18w. Spudded 30 ft.

Leflore County

McCraw et al's No. 1 Tidwell, C NW SE Sec. 17-3-22. **Set 15-in. pipe 377 ft.**

Lincoln County

W. N. Anthony's No. 1 Fruin-Eckman, SE SE SW Sec. 4-16-1e. **Rigging up standard tools; T.D. 5,181 ft.; bailed at 300 ft.; small show of oil and water; shut down.**

M. W. Coxart's No. 1 Sekovaty, NE NE NW Sec. 14-14-3. Cellar and pits.

J. Garfield Buell et al's No. 1 Seward, NE NW NE Sec. 25-14-3. Cleveland sand 3,245 ft., T.D.

Fred McDuff's No. 1 Jacob, NE NE SE Sec. 10-15-3. Cellar and pits.

Logan County

Sinclair Prairie and Slick-Urschel's No. 1 Koatsch, SW cor. Sec. 23-15-3w. **Second Wilcox 6,322-43 ft.; wtr.; P.B. to 6,304 ft. in Simpson; making 50 bbls. oil per day; S.I. for tanks.**

Stanolind O. & G. Co., Amerada Pet. Corp. and Eason O. & R. Co.'s No. 1 Gragg, SW SW NE Sec. 26-18-4w. **T.D. 5,870 ft.; cemented off drill pipe; pulled whipstock; fishing 5,448 ft.; P.B. with 900 sacks of cmt.**

Texas Co. et al's No. 1 Wood, SW SW NE Sec. 34-16-4w. **Top Wilcox 6,394 ft.; T.D. 6,433 ft., fishing for drill pipe; plugged back and set whipstock at 5,830 ft.; drlg. at 6,020 ft.**

McIntosh County

Indian Ty. Ill. Oil Co.'s No. 1 Tancred, 1,050 ft. S and 390 ft. E of C. Sec. 9-9-14. Rig.

Okfuskee County

W. J. Sherry et al's No. 1 Washington, SW SW NE Sec. 21-13-7. Drlg. 1,205 ft.

Stanolind and Amerada's No. 1-A Washington, SE NE NE Sec. 12-13-7. Location.

Sunray Oil Co.'s No. 1 Culla, NE SW NE Sec. 13-12-8. Viola 4,123 ft., set 8-in. csg.; testing shut off.

Oklahoma County

Sinclair Prairie O. & G. Co.'s No. 1 Corbett, NE NW NE Sec. 17-13-3w. **Wilcox sand 6,645-6,706 ft.; plugged back to 6,524 ft.; flowed 72½ bbls. gasoline in 15 hrs.; estimated 6,000,000 to 8,000,-000 ft.; gas. hole bridged; trying to knock out bridge.**

Osage County

J. A. Freeberg et al's No. 1, NE cor. SE Sec. 1-25-6. Drlg. 3,075 ft.

Texas Co.'s No. 1, SW cor. SE Sec. 22-24-6. Mississippi lime 2,824 ft.; drlg. 2,929 ft.

Pawnee County

Stanolind Oil & Gas Co.'s No. 1 Dentor, NE SW SE Sec. 32-22-3. (Old well drilling deeper). **Cored 4,309-17 ft., recovered portion slightly stained; abd.**

Pittsburg County

Vaughn Production Co. et al's No. 1 Chunn, 990 ft. N and 614 ft. W of C Sec. 29-4-14. **Drlg. 1,560 ft.**

Pontotoc County

Ada Petroleum Co.'s No. 1 Simmons, CWL NW NW Sec. 8-3-6. Bromide 4,545 ft., sand 4,660 ft., drlg. 4,690 ft.

E. M. Blanchard's No. 1 Crabtree, NE SE NE Sec. 27-3-6. **S.D. 2,920 ft.**

Continental Oil Co.'s No. 1 McCarty, C SE NW Sec. 12-1-7e. McLish 4,427 ft.; T.D. 4,446 ft.; tools recovered, 15,000,000 ft. of gas.

Delaney et al's No. 1 Fox, 1,337 ft. from N and 1,091 ft. from E lines of SE Sec. 2-1-7. Cellar and Pits.

Franks Bros.' No. 1 Abbott, SW NW NE Sec. 34-3-6. **Rig.**

Gypsy Oil Co.'s No. 1 Emry, SW SW NE Sec. 15-2-6. Drlg. in Atoka sand 2,763 ft.

McBride, Inc., et al's No. 1 Copeland, SE NW Sec. 31-4-5. **Viola 1,636 ft.; T.D. 1,950 ft.; sulphur water; underreaming 6-in. csg.**

Orbit Oil Co.'s No. 1 Federal Land Bank, SE SW SW Sec. 10-4-3. Drlg. 680 ft.

Southern Oil Co.'s No. 1 Perry SW SW NW Sec. 11-4-6. Drlg. 2,700 ft.

Pottawatomie County

Ross Oil Co. et al's No. 1 Sparkman, SE NE Sec. 33-8n-4e. Drlg. 2,030 ft.

Seminole County

L. Cooper's No. 1 Chandler, NE SE SW Sec. 4-5-6. **S.D. 1,780 ft.**

Deep Rock Oil Co.'s No. 1 Robert, SW NW NW Sec. 32-9-8. Cromwell at 3,629 ft., Caney 3,750 ft.; drlg. 3,888 ft.

Ray Dorris and J. T. Hall's No. 1 Dorris, SE SE SW Sec. 31-10-7. Sand 520-60 ft.; H.F.W.; abd.

Texas County

Cabot Carbon Co.'s No. 1 Mathews, C NW Sec. 8-3-15 (Cimarron Meridian). 2,500,000 ft. gas 2,675-80 ft.; T.D. 2,680 ft.; fishing for tools.

Washita County

L. P. McWhirter's No. 1 fee, SW cor. Sec. 34-8n-19w. T.D. 1,100 ft., fishing for U. R. lugs.

SOUTHERN OKLAHOMA

Atoka County

L. O. Garner et al's No. 1 Garner, C NE NW NE Sec. 27-1n-15 (800-ft. test). **S.D. 825 ft.**

Malarnee et al's No. 2 D.O.K. land, C SE SE Sec. 35-2s-13. **T.D. (corrected) 3,136 ft.; cleaning out.**

Mid-Continent Pet. Corp. et al's No. 1 Fulton, SW cor. Sec. 19-1s-12e. T.D. 2,005 ft. in Atoka; tools moved out.

R. H. Pierce et al's No. 1 Aetna Life Ins. Co., NW SW NE Sec. 10-1n-13e. Drlg. 2,056 ft.

A. J. Sanders' No. 1 Redden, NE SW SW Sec. 19-1n-15e. **Drlg. 220 ft.**

Vierson et al's No. 1 Williams, NE SW NW Sec. 34-2s-10. Drlg. 2,245 ft.

Bryan County

H. B. Smith et al's No. 1 Henry, C NW NE Sec. 10-8s-7e. **T.D. 288 ft., cleaning out.**

Carter County

Carter Oil Co.'s No. 1 Carter-Williams, SW NE SW Sec. 27-2s-3w. T.D. 8,088 ft., flowed 10,000 bbls. of oil in 24 hrs.; trying to kill production and run csg.

Louis Sikes' No. 1 Byrd, SW SE SW Sec. 4-2s-2w. T.D. 965 ft.

Choctaw County

Rhodes et al's No. 1 Possumik Savings Bank, SW NW Sec. 1-5s-17. **Fishing tools at 695 ft.**

Comanche County

George Pace et al's No. 1 Spencer, SW SW SE Sec. 21-3-10w. **Set 12½-in. pipe 70 ft.**

Imbodin et al's No. 1 Woods, SE SW SE Sec. 27-2-10w. Pits.

F. F. Stevens' No. 1 Green, SE SE SW Sec. 2-1n-13w. **Fishing for tools 1,893 ft.**

Jackson County

Associated Oil Co.'s No. 1 Harrell, NE NE SE Sec. 13-1s-21w. **S.D. 1,360 ft.**

Gypsy Oil Co.'s No. 1 Stokes, SE NW SW Sec. 11-1-20w. **Lime 1,709-11 ft.; T.D. 1,722 ft.; S.D.**

Jefferson County

M. H. Barrett's No. 1 Moss, C N½ NW SW Sec. 9-6s-7w. Dry sand 492-508 ft.; drlg. 690 ft.

Gypsy Oil Co.'s No. 1 James, SW SE SE Sec. 30-6s-6w. **S.D. 2,102 ft.**

Johnston County

Equitable O. & G. Co.'s No. 1 Bellsey, NE SW Sec. 12-2s-4e. Drlg. 575 ft.

Godfrey & Neff's No. 1 Everets, NE cor. SE SW SW Sec. 20-4s-6. **Drlg. 150 ft.**

Moore & Wirick's No. 1 Westheimer & Daube, SE NW NE Sec. 19-3s-4e. Tools on ground.

Neff & Godfrey's No. 1 Merrell, 820 ft. N. 670 ft. W SE cor. Sec. 28-4s-6e. Drlg. 510 ft.

Love County

Amerada Pet. Corp.'s No. 1-A Westheimer & Daube, SW SE SW Sec. 27-6s-2e. Drlg. 1,235 ft.

Sinclair Prairie Oil Co.'s No. 1 Stockton, SE SE SW Sec. 26-6s-2w (5,000-ft. test). Coring; T.D. 6,132 ft.

Marshall County

M. H. Barrett's No. 1 Moss, C N½ NW SW Sec. 9-6s-7w. Drlg. 715 ft.

Jess Cook et al's No. 1 May, NE NW Sec. 12-8s-5. **Drlg. 75 ft.**

Norman Smith's No. 1 Chestnut, NE cor Sec. 22-8s-5e. **S.D. 275 ft.**

Paul Robb's No. 1 Vittetoe, C NE SE Sec 11-5s-4e. **Top Sylvan shale 5,405 ft.; T.D. 5,441 ft.; S.D.**

Selby Oil & Gas Co.'s No. 2 Gilbert, SE cor. SW NE SW Sec. 25-8s-7e. Rigging up rotary.

Pushmataha County

C. W. Whitehead et al's No. 1 Misser, SE SW SW Sec. 35-3s-18e. Drlg. 3,480 ft.

Stephens County

Franklin & Duncan's No. 1 Woolsey, NW NW SE Sec. 10-3s-6w (old well deepening). **T.D. 1,050 ft.; pulled rig in.**

Prince Bros.' No. 1-A Williams, C SW SE Sec. 19-2-8w. **Drlg. 1,724 ft.**

Shasta Oil Co.'s No. 1 Fuqua, NE NW NW Sec. 13-1s-7w. Drlg. 1,000 ft.

Tillman County

J. B. Connelly's No. 1 McCord, NW SE NE Sec. 15-1-17w. T.D. 665 ft.

Gypsy Oil Co.'s No. 1 Schenck, SE NW SE Sec. 31-1s-18w. T.D. 1,485 ft., making repairs.

Loper et al's No. 1 Conrad, NE cor. Sec 35-1s-19w. **Drlg. in brown shale 1,660 ft.**

KANSAS WILDCATS

Week Ending November 2

(Descriptions are East unless marked otherwise)

Barton County

Lario O. & G. Co. et al's No. 1 Peter, NW cor. Sec. 24-20-11w. **Siliceous 3,273-91 ft.; pumped 305 bbls. in 12 hrs.; acidized, pumped 220 bbls. oil in 4½ hrs.**

Lario O. & G. Co. et al's No. 1 Smith, SW NW NW Sec. 36-18-13w. Drlg. 225 ft.

Murphy & Morgan's No. 1 Robinson, NE NE SW Sec. 21-16-14w. Cellar and ponds.

C. L. Price et al's No. 1 Ehrlich, NW NW SE Sec. 10-16-13w. Water at 3,375 ft.; abandoned.

Suppes & Witt's No. 1 Hayes, NW cor Sec. 7-16-16w. **Drlg. 3,470 ft.**

Torry & Feaster's No. 1 Feist, NE NE SE Sec. 29-18-11w. Siliceous lime 3,430-32½ ft.; T.D. 3,200 ft.; oil in hole.

W. E. Witt's No. 1 Murry, NW NW SW Sec. 14-17-14w. Drlg. 150 ft.

Butler County

Mohawk Oil Co.'s No. 1 Overstreet, NW cor. (Lot 21), Sec. 19-26-5. **K.C. lime 2,052 ft.; pay 2,058-67 ft.; acidized; 100 bbls. in 24 hrs.; completed.**

Palmer et al's No. 1 Ellis, NE cor. Sec 7-25-4. Dry and abandoned 2,753 ft.

Western Kansas O. & R. Co.'s No. 1 Kins & Marshall, NW NW SW Sec. 11-28-6.

Straighten Out... those CROOKED Holes with SPERRY - SUN Well-Surveying Instruments

Well!

one Kept Straight with the H - K (Hewitt) (Kuster) Clinograph

The H-K Clinograph (designed for open holes only) lowered on a sand or bailing line at a speed ranging from 400 to 800 feet per minute, makes available permanent, accurate photographic records on paper discs of inclination and direction within five minutes after removing instrument from hole. (U. S. Patent 1,812,994 and others pending).

Anchoring bottom plug nose to instrument.

Well!

one Kept Straight with the SURWEL Clinograph

The SURWEL is a gyroscopic Clinograph which provides a map of the well at all depths prepared from actual photographic records. Unaffected by *Tortuosity or Magnetic Influence.* Self-checking—produces duplicate records going in and coming out. U. S. Patents 1,124,068, 1,812,994, 1,959,141, 1,960,038, 2,012,455, 2,012,456 and others pending).

Reading the Photograph story just told by a SURWEL run.

Well!

one Kept Straight with the SYFO Clinograph

The SYFO can be used on a wire line or as a "Go-Devil" running inside the drill stem or on sand or bailing line in open hole. It affords a quick inexpensive daily record on paper of vertical deviation in drilling—*without* the use of dangerous acids. (U. S. Patent 1,962,634, 2,013,875 and others pending).

Tightening up on SYFO case preparatory to lowering into hole.

Photograph below shows sample record made by the H-K. Photographs at right show SURWEL and SYFO Clinograph.

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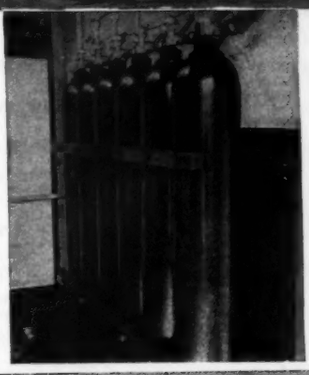
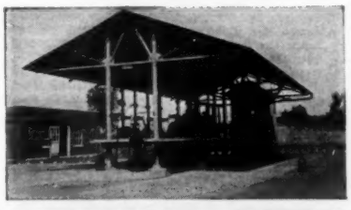
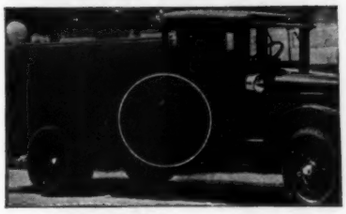


OIL *from "Boats that Won't Burn" is* LUX-PROTECTED *direct to* YOUR CUSTOMER

Above—Two LUX protected boats and typical LUX system.
Below—LUX protected terminal and tank truck.





ON HUNDREDS of navigable waterways throughout the land oil tankers and barges are a familiar sight. Oil can be delivered in bulk by water much more cheaply than it can be transported by rail in tank cars. Savings upwards of a cent per gallon are effected—But—the additional fire hazards involved must be protected—the oil must reach the consumer on time.

You can banish the fire worry right through from refinery to tank truck delivery with LUX equipment. Hundreds of tanker and barge owners today are depending on Lux and Lux-O-Matic systems to handle this problem effectively. Twenty-six tankers in one large oil company's fleet alone have LUX systems on board.

What is the LUX system? It employs the same LUX carbon dioxide gas that protects refineries, terminals and tank trucks. On boats this harmless fire killing gas is piped into fire hazard areas and discharged through strategically installed shielded nozzles to instantly smother fire through the creation of an inert atmosphere. Control, automatic or manual, of the release of this gas from its storage cylinders is effected safely away from the fire area.

Our engineering force is at your service in the solution of any oil fire protection problem. The experiences of thousands of successfully LUX defeated oil fires is your guarantee. Prices on portables begin at $14.00, on systems at $60.00. Complete information is available promptly. Write to

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GREAT BARGAINS IN BIG LOTS TO DOMESTIC AND FOREIGN BUYERS

BEST CASH PRICES SOLICITED FROM ALL PRODUCERS

J. H. SMITH, 204 ISHAM BLDG., LONGVIEW, TEXAS

DEC. 5 SEISMOGRAPH OFFER WITH INSTRUCTIONS

Siliceous lime 3,044-49 ft.; acidized; pumped 208 bbls. in 12 hrs.; shut in for pipe line.

Cowley County

E. B. Shawver et al's No. 1 Hanna, NE NW SE Sec. 29-30-3.
Drlg. 3,075 ft.

T. C. Johnson's No. 1-A Ferguson, NW SW SE Sec. 17-30-3.
U. R. 5-in. csg. to 2,050 ft.

Wakefield et al's No. 1 Auman, SE SE NE Sec. 32-33-3.
Chat 3,333 ft.; 100 ft. oil in hole; water at 3,348 ft.; P.B. to 3,338 ft.; shot 30 qts. and swabbed 15 bbls. oil and 7 bbls. water in 8 hours.

Earl Wakefield's No. 1 Hanna, NE NE SW Sec. 2-31-4.
Drlg. 2,355 ft.

Winkler, Koch et al's No. 1-B Harlan, C NW NE Sec. 13-31-7.
Shut down 1,400 ft.

Dickinson County

Dutch Oil Co.'s No. 1 Phillips, C NE NW Sec. 15-15-1e.
Drlg. 3,370 ft.

Elk County

T. C. Johnson's No. 1-A Ferguson, NW SW SE Sec. 17-30-8.
Drlg. 1,225 ft.

Ellis County

Helmerich & Payne et al's No. 1 Kuhn, C NE quarter Sec. 16-14-20w.
Lamotte sand 3,897 ft.; fishing at 3,900 ft.; moving in rotary tools.

P. G. Reynolds et al's No. 1 Walter, SE NE SW Sec. 2-12-18w.
Moving in material.

Twin Drlg. Co.'s No. 1 Goetz, SW SW SE Sec. 3-14-17w.
Drlg. 715 ft.

Ellsworth County

Gypsy Oil Co. and Texas Co.'s No. 1 Lapham, SW cor. Sec. 27-16-7w.
Drlg. 2,960 ft.

Tom Palmer's No. 1 Splitter, NW NE SE Sec. 17-17-8w.
Drlg. 2,850 ft.

Slick, Pryor & Lockhart's No. 1 Sturn, NW NW SW Sec. 26-17-10w.
Drlg. 525 ft.

Graham County

Cusco Oil Co.'s No. 1 Kaufman, C NE NE Sec. 18-6-24w.
Rigging up.

Vickers Pet. Co. & Phillips Pet. Co.'s No. 1 Hutton, 430 ft. W and 330 ft. S of NE SE Sec. 29-8-22w.
T.D. 875 ft.; cleaning out 828 ft.

Grant County

Piney Oil & Gas Co.'s No. 1 Kennedy, C SW¼ Sec. 10-29-36w.
Drlg. 900 ft.

Haskell County

Helmerich & Payne's No. 1 Elliott, C SW Sec. 30-29-33w.
Drlg. well for drilling water.

Kingman County

D. R. Lauck's No. 1 Skilling, SE NE SW Sec. 33-27-8w.
Chat 4,017 ft., set 8-in. csg. 4,018 ft.

Logan County

Alma Pet. Co. and McNeely's No. 1 Watchorn, C SW NE Sec. 13-15-33w.
Drlg. 5,740 ft.

McPherson County

Anderson & Kerr's No. 1 Wernet, NW cor. Sec. 24-20-4w.
Wilcox sand 3,636-47 ft.; dry and abandoned.

Carey & Miller's No. 1 Husband, SE SE NW Sec. 6-19-1w.
Siliceous lime 3,754-58 ft.; hole full of water, abandoned.

Whan et al's No. 1 Stromquist, SW SE SE Sec. 2-19-3w.
Drlg. 2,360 ft.

Norton County

Lario O. & G. Co. and Elwell's No. 1 Kennedy, SW SW NW Sec. 22-3-22w.
Building rig.

Pratt County

Skelly Oil Co. et al's No. 1 Comm. Gilchrist, C SE¼ Sec. 7-28-11w.
Drlg. 3,344 ft.

Reno County

Allison & Fitzwilliams' No. 1 Dukelow, NE NE NE Sec. 11-22-6w.
Siliceous lime 4,181-4,245 ft., dry and abandoned.

Dawe & Dustin's No. 1 Ghormley, C NE NW Sec. 17-24-7w.
Spudded and shut down.

Foraker et al's No. 1 Hiett, SE SW NE Sec. 34-24-4w.
U.R. 12-in. csg. to 1,485 ft.

Shell Pet. Corp.'s No. 1 Reese, center W½ W½ SW¼ Sec. 11-26-9w.
Viola 4,123 ft.; flowed 878 bbls. in 24 hrs.; set 8-in. csg. 4,135 ft.; T.D. 4,154 ft.

Stanolind & Amerada's No. 1 J. J. Hilger, A. NE NE SW Sec. 21-26-4w.
Wilcox 4,068-74 ft.; Siliceous 4,174 ft.; coring 4,192 ft.

Winkler & Koch et al's No. 1 Brownlee, C NW SW Sec. 31-24-10w.
Drlg. 1,585 ft.

Rice County

Day's No. 1 Mason, NW NE NE Sec. 28-21-7w.
S.D. 2,690 ft.

Detrick et al's No. 1 Monroe C NE NE Sec. 9-20-7w.
T.D. 975 ft.

Empire O. & R. Co.'s No. 1 Schroeder, SW SE SE Sec. 7-18-9w.
Drlg. 2,085 ft.

Detrick et al's No. 1 Conner, C NE NE Sec. 28-19-7w.
Drlg. 2,540 ft.

Rooks County

El Dorado Refining Co.'s No. 1 Marshall, C SE SE Sec. 5-7-17w.
Drlg. 2,395 ft.

F. A. Gillespie & Sons' No. 1 Low, NE NE NW Sec. 12-6-18w.
T.D. 1,516 ft.; cementing hole at 1,300 ft.

Murfin et al's No. 1 Washusin, NE NE SE Sec. 19-9-16w.
S.D. 1,300 ft.

Rush County

E. L. Byers et al's No. 1 Ewing, NW SW SW Sec. 35-19-15w.
Bldg. rig.

Darby Pet. Co.'s No. 1 Jacobs, SW SW NW Sec. 2-16-19w.
Location.

Ramsey Pet. Co. et al's No. 1 Darkes, C W½ W½ NW Sec. 5-17-20w.
Small flow of oil 3,934-39 ft.; U. R. 5-in. csg.

Russell County

Central Pet. Co.'s No. 1 Boxberger, NW cor. Sec. 26-15-15w.
Drlg. 1,585 ft.

Coralena Oil Co.'s No. 1 Berrick, NE NW NE Sec. 6-15-13w.
Oswald 2,894-2,928 ft.; swabbed 65 bbls. oil in 6 hrs.; water 3,219-20 ft.; plugged back to 2,918 ft.

L. D. Davidson et al's No. 1 P. Polcyn, SE SW NW Sec. 6-14-15w.
Rig.

Hartman & Blair's No. 1 Clausen, SE NE SW Sec. 34-12-14w.
Oswald 2,751 ft.; pay 2,796-2,800 ft.; T.D.; acidized; potential 112 bbls. of oil, 57 bbls. water; hole full water 2,122 ft.; Siliceous lime 3,089 ft., abandoned.

T. C. Johnson et al's No. 1 Mermis, NE NE SW Sec. 29-13-15w.
Drlg. 2,800 ft.

Sam Murphy et al's No. 1 Enschutz & Schaffer, SW cor. Sec. 10-15-13w.
Moving in material.

Murfin et al's No. 1 Gorham estate, NE NE SE Sec. 29-14-15w.
Run 12-in. csg. to 615 ft.

Sedgwick County

Derby et al's No. 1 Bartholomew, SW NW NW Sec. 8-27-4w.
Siliceous 4,137 ft.; T.D. 4,155 ft.; water; P.B. 4,006 ft. and drilled to 4,017 ft.; acidized; no test.

Dickey Oil Co. et al's No. 1 Chase, SE cor. Sec. 11-27-2.
Siliceous 3,262-79 ft.; pumped 50 bbls. oil, 60 bbls. water; cementing above pay.

Stafford County

Atlantic Oil Producing Co., Phillips Petroleum Co. et al's No. 1 Brown C NW NE Sec. 16-23-13w.
Drlg. 3,845 ft.

Atlantic Oil Prod. Co. and Phillips Pet. Co.'s No. 1 Cornwall, C NE SW Sec. 4-25-13w.
Dry and abandoned 4,270 ft.

Sumner County

Orcutt & Stewart's No. 1 Newton, SE cor. Sec. 21-30-2.
Spudding.

C. Pulse's No. 1 Buss, NW cor. Sec. 12-32-2.
Drlg. 565 ft.

D. J. Wilson et al's No. 1 Clark, 1,320 ft. from W and 25 ft. from S line of NW Sec. 15-35-1w.
Sand 2,528-40 ft., show of oil and gas.

Winkler & Koch et al's No. 1 Belsley, SW SW NW Sec. 2-32-2w.
Viola 4,261 ft.; drlg. 4,266 ft.

Trego County

Central Commercial's No. 1 Wagg, NW NW SE Sec. 17-13-21w.
Drlg. 995 ft.

Hansa & Lauck and Olson Drlg. Co.'s No. 1 Lang, SE SE NW Sec. 1-14-21w.
Siliceous lime 3,898-3,900 ft.; tested ¾-bbl. per hour; set pipe 3,898 ft.

Vickers et al's No. 1 Secor, NW NW NW Sec. 25-15-24w.
Siliceous lime 4,405 ft.; U. R. 5-in. csg.

Woodson County

Coulter, Davidson et al's No. 1 Parke, NW cor. NE Sec. 25-25-13.
Fishing 1,454 ft.

GULF COAST WILDCATS

Week Ending November 2

Raccoon Bend—Austin County

Humble O. & R. Co.'s No. 16-X Woodley, 750 ft. NE of SW line, 850 ft. NW of SE line, 300 ft. SE of No. 15-X, Wm. Harvey Sur.
10¾-inch csg. at 1,143 ft.

Humble O. & R. Co.'s No. 8-X Hellmuth, 2,095 ft. from NW line, southeasterly along N line of S. Hellmuth tract, 464 ft. SW at right angles from NE line of lease, Wm. Harvey Sur.
Coring sandy shale, 3,150 ft., 10¾-in. csg. at 1,150 ft.

Humble O. & R. Co.'s No. 15 Woodley, 1,150 ft. NW of SE line, 750 ft. NE of SW line, 607 ft. southerly from No. 14-X, William Harvey Sur.
T.D. 4,144 ft.; 7-in. csg. at 4,117 ft.; S.D.

Humble O. & R. Co.'s No. 8 Wilson, 150 ft. NE of SW line, 1,000 ft. SE No. 6-X, William Harvey Sur.
T.D. 4,174 ft.; drlg. sand 3,395 ft.

Humble O. & R. Co.'s No. 3 H. F. Granen, 682 ft. NE of No. 1, 150 ft. SE of NW¼ of 63.8-ac. tract, Smeathers Sur. Location.

Humble O. & R. Co.'s No. 7-X McCasland, 190 ft. NW line, 168 ft. SE line of Smeathers & White Sur. Location.

Damon Mound—Brazoria County

Intercoastal Oil Co.'s No. 14 Wisdom, 34 ft. NE of SW line, 43 ft. NW of SE line of Lot A, Blk. 51, A. Darst Sur. Location.

Hastings—Brazoria County

Humble O. & R. Co.'s No. 2 Cannon, 330 ft. out of NE cor. of 40-ac. tract, H.T. &B. Sur. No. 36.
Coring sand showing oil at 5,869 ft.

Humble O. & R. Co.'s No. 1 J. F. Bridges, center of N 10 acres of 20-ac. lease, A.C.H.&B. Sur. No. 2. Location.

Humble O. & R. Co.'s No. 2 J. F. Bridges, center of S 10 acres of 20-ac. lease, A.C.H.&B. Sur. No. 2. Location.

Stanolind O. & G. Co.'s No. 2 Shaw, 330 ft. W of most northerly NE cor. of 130-acre tract, H.T.&B. Sur. No. 36. Location.

Stanolind O. & G. Co.'s No 4 Drake, 330 ft. S, 330 ft. E of most westerly NW cor. of Drake 120-acre tract, H.T.&B. Sur. No. 36. Location.

Stanolind O. & G. Co.'s No. 3 Pennock, 1,330 ft. S, 330 ft. E of NW cor. of 40-acre tract, H.T.&B. Sur. No. 36. Derrick.

Stanolind O. & G. Co.'s No. 2 Hutchinson, 330 ft. E and 2,404 ft. N of SW cor. of 40-ac. tract, H.T.&B. Sur. No. 36.
Coring sand 6,018 ft.

Stanolind O. & G. Co.'s No. 1 Whiton, 330 ft. S, 500 ft. W of the NE cor. of G. W. Whiton 10-ac. tract, A.C.H.&B. Survey No. 2.
Cemented 7-inch csg. at 6,080 ft.

Stanolind O. & G. Co.'s No. 2 Ford, 330 ft. N, 3,092 ft. W of SE cor. of 199.3-ac. tract, A.C.H.&B. Sur. No. 1.
T.D. 6,112 ft., cemented 11 ft. of 5-inch liner.

Stanolind O. & G. Co.'s No. 2 Kidd, A.C. H.&B. Sur. No. 2, 330 ft. E of most easterly W line, 416 ft. S of N line of 58.4-ac. tract.
T.D. 6,115 ft.; 7-in. csg. at 6,083 ft.; swabbing.

Stanolind O. & G. Co.'s No. 2 Miller, A.C.H.&B. Sur. No. 2, 831 ft. S, 258 ft. W of NE cor. of 39.39-ac. tract.
T.D. 6,080 ft.; 7-in. csg. 6,001 ft.; I.P. 645 bbls. per day, ¼-in. choke, T.P. 900 lbs., C.P. 875 lbs.

Stanolind O. & G. Co.'s No. 3 Williams, A.C.H.&B. Sur. No. 1, 330 ft. W, 119.4 ft. S inside of NW cor. of 38.5-ac. tract. Running tubing and screen at 6,106 ft.; 7-in. csg. at 6,093 ft.

Stanolind O. & G. Co.'s No. 3 Drake, 330 ft. N, 1,650 ft. W from SE cor. of 120-ac. lease, H.T.&B. Sur. No. 36. Derrick.

Stanolind O. & G. Co.'s No. 2 Pennock, 330 ft. N, 1,650 ft. W from SE cor. of 40-ac lease, H.T.&B. Sur. No. 36.
Drlg. sand 3,310 ft., 10¾-in. csg. at 2,082 ft.

Stanolind O. & G. Co.'s No. 4 Sneed, 330 ft. S, 330 ft. W of NE cor. of Lot 12, D. M. Jay Subd., on Sneed 225-ac. tract, A.C. H.&B. Sur. No. 2.
Drlg. shale 3,150 ft.

Manvel—Brazoria County

Alpha Pet. Co.'s No. 1 Hart, 185 ft. NSL, 330 ft. EWL, Lot 9, H.T.&B. Sur.
W.O.C. 5,721 ft.

Gulf Prod. Co.'s No. 5 Colby, 330 ft. from NW line of lease, 660 ft. SW of No. 3, T. Spraggins Sur.
Shale and boulders 2,395 ft., no report.

Jay Simmons' No. 1 Wilson, center of Lot 25, H.T.&B. Sur. No. 23. Location.

Sinclair Prairie Oil Co.'s No. 1 Michaelson, 330 ft. E of W line and midway of N and S lines, Lot 19, H.T.&B. Sur. No. 34. Location.

J. W. Sorrells' No. 1 Swift, Blk. 21, Abst. 318, H.N. Little Sur.
Derrick.

Texas Co's No. 19 Houston Oil Field Assn., 330 ft. N, 76 ft. from SW cor. of Lot No. 31, A.C.H.&B. Sur. No. 91.
Rig up.

Texas Co.'s No 17-B Belcher, N 48 deg., W 2,200 ft., N 42 deg., 955 ft. from S cor. of lease and survey, H. N. Little Sur.
Derrick.

Texas Co.'s No. 2 John Groce, 857 ft. S, 200 ft. E of NW cor. of Chas. O'Donnell Sur.
Drlg. clay 460 ft., 16-inch csg. at 40 ft.

Texas Co.'s No. 1 Doonan, 990 ft. N, 42 deg. E and 330 ft. S, 48 deg. E from W cor. of Lot 17, T. Spraggins Sur.
Drlg. gumbo and lime 1,995 ft.

Texas Co.'s No. 4 Rash, 48 deg. E, 1,650 ft. S and 42 deg. W, 330 ft. N of NE cor. of lease, T. Spraggins Sur.
Plugged back to 4,198 ft. from 4,300 ft.

Texas Co.'s No. 16-B Belcher, 1,540 ft. N, 48 deg. W and 660 ft. N, 42 deg. E of SW cor. of lease, H. N. Little Sur.
T.D. 5,150 ft.; I.P. 445 bbls. per day, ¼-in. choke, T.P. 550 lbs., C.P. 460 lbs.

Texas Co.'s No. 1 Richard, 2,475 ft. N, 330 ft. W of SE cor. of Lot 15, H.&T.B. Sur., Sec. 23.
7-in. csg. at 4,047 ft.; taking potential test.

Texas Co.'s No. 2 Dawson, 347 ft. S, 341 ft. W of NE cor. of Lot 58, H.T.&B. Sur. No. 23. Location.

Old Ocean—Brazoria County

Harrison & Abercrombie's No. 2 Bernard River, 1,000 ft. N, 64 deg. W, 400 ft. S, 36 deg. W of No. 1, Charles Breen Sur.
Cementing 7-in. csg. at 5,580 ft.

Pledger—Brazoria County

Humble O. & R. Co.'s No. 3 Smith, 5,187 ft. NE of most southerly SW line, 2,103 ft. NW of SE line, D. McNeel Sur.
Drlg. shale 6,400 ft.

West Columbia—Brazoria County

Varner Oil Co.'s No. 1 Hogg, 800 ft. from most easterly W line and 2,600 ft. from N line of 400-ac. tract, M. Varner Sur.
Spudded and S.D.

Port Lavaca—Calhoun County

Crown Central Oil Co.'s No. 1 Wilson, 600 ft. NW line, in center of tract, A. Esparza Sur.
T.D. 6,315 ft.; plugged back 3,959 ft.; set whipstock in shale at 4,930 ft.

Halliburton Oil Co.'s No. 4 Burton, M. Sanches Sur.
Cemented 7-in. csg. at 6,243 ft.; W.O.C.

Anahuac—Chambers County

Domistic Exploration Co.'s No. 1 Marshall, 466 ft. out of NE cor. of A. W. Marshall 54.6 acre tract, H.&T.C. Sur., Sec. 55.
Rig up.

Gulf Prod. Co.'s No. 1 Knowles, 2,154 ft. SN line, 467 ft. EW line, Sec. 48, H.&T.C. Sur.
Drlg. shale 8,513 ft.

Humble O. & R. Co.'s No. 10 Milton, 466 ft. from N and E lines of A. Milton Sur. No. 58. Location.

Humble O. & R. Co.'s No. 6 Broussard, 3,058.4 ft. from W line, 466 ft. from N line, H.&T.C., Sec. 63. Location.

Humble O. & R. Co.'s No. 7 Clark, 1,205.5 ft. from N line, 466 ft. from W line, H.&T.C., Sec. 57. Location.

Humble O. & R. Co.'s No. 1 Zappe, 466 ft. from S and E lines, H.&T.C., Sec. 51. Location.

Humble O. & R. Co.'s No. 2 Broussard, 869 ft. E of No. 1-B, 466 ft. S of N line, Sec. 59, H.&T.C. Sur. Location.

Humble O. & R. Co.'s No. 3-B Broussard, 869 ft. E from No. 2-B, 466 ft. S of N line, Sec. 59, H.&T.C. Sur. Location.

Humble O. & R. Co.'s No. 9 Middleton, 873 ft. S of No. 5, 466 ft. W of E line, Sec. 58, H.&T.C. Sur. Derrick.

Humble O. & R. Co.'s No. 3 White, 933 ft. W from No. 2, 466 ft. N of S line of lease, James McGahee Sur.
Drlg. shale 6,515 ft.

Humble O. & R. Co.'s No. 1 Broussard, 466 ft. S of N line, 466 ft. E of W line of Sec. 59, H.&T.C. Sur.
T.D. 7,082 ft., top sand 6,902 ft.; 7-in. csg. at 7,020 ft.; drlg. plug.

Humble O. & R. Co.'s No. 5 Broussard, 2,212 ft. E of W line, 466 ft. S of N line of Sec. 63, H.&T.C. Sur.
T.D. 7,081 ft.; top sand 6,941 ft.; 7-in. csg. at 7,030 ft.; I.P. 26 bbls. per hour, ¼-in. choke, T.P. 1,025 lbs.; C.P. 1,100 lbs.

Humble O. & R. Co.'s No. 5 Clark, 1,946 ft. S of N line, 466 ft. E of W line, Sec. 57, H.&T.C. Sur.
T.D. 7,085 ft.; 7-in. csg. at 7,041 ft.; I.P. 18 bbls. per hour, ¼-in. choke, T.P. 700 lbs., C.P. 850 lbs.

Humble O. & R. Co.'s No. 6 Clark, 1,330 ft. N of S line, 466 ft. E of W line of Sec. 57, H.&T.C. Sur. Location.

Humble O. & R. Co.'s No. 7 Middleton, 466 ft. E of W line and N of S line of 100-ac. tract in NE cor. of Sec. 58, H.&T.C. Sur.
Drlg. shale 1,854 ft.; 10¾-in. csg. at 1,524 ft.

Humble O. & R. Co.'s No. 6 Engel's, 1,000 ft. E of No. 1 466 ft. N of S line, 1,474 ft. E of W line, Sec. 50, H.&T.C. Sur.
T.D. 7,085 ft.; I.P. 25 bbls. per hour, ¼-inch choke, T.P. 1,250 lbs., C.P. 2,000 lbs.

Humble O. & R. Co.'s No. 8 Middleton, 2,212 ft. E of W line, 466 ft. N of S line of Sec. 58, H.&T.C. Sur.
Drlg. shale 549 ft.

Humble O. & R. Co.'s No. 2 Broussard, 2,333 ft. E of W line, 2,332 ft. N of S line of Sec. 63, H.&T.C. Sur. Location.

Sun Oil Co.'s No. 4 White, 933 ft. W of No. 3., 516 ft. S of N line of lease, J. McGahey Sur.
Moving in.

Sun Oil Co.'s No. 3 White, 507 ft. S of N line, 1,933 ft. W of No. 2 James McGahey Sur.
T.D. 7,084 ft.; 7-in. csg. at 7,040 ft.; W.O.C.

Johnson & Anderson's No. 1 J. T. White 466 ft. from S and E lines of N 400 acres of James McGahey Sur.
Drlg. shale 2,250 ft.

Barbers Hill—Chambers County

Sun Oil Co.'s No. 1 Higgins, (W.O.) cutting 7-in. liner at 2,304 ft.

Sun Oil Co.'s No. 15 Wilburn (W.O.)
Bidetracking at 4,302 ft.

Sun Oil Co.'s No. 16 Wilburn, 80 ft. N, 75

ft. E of SW cor. of tract, Wm. Hodges Sur.
W.O.C. 163 ft.

Stanolind O. & G. Co.'s No. 29 Chambers, 224 ft. E of No. 21 W. Bloodgood Sur. Derrick.

Stanolind O. & G. Co.'s No. 31 Chambers, 20 ft. S, 50 ft. W of NW cor. of Sur. A lease.
Derrick.

Big Creek—Fort Bend

Gulf Prod. Co.'s No. 65 Davis, 2,260 ft. NE along SE line of Davis 2,228-ac. tract or NW cor. Texas Co.'s 200-ac. tract and 1,775 ft. NW at R&A, 500 ft. SE of No. 64 M. Young Sur.
W.O.C. 3,893 ft.; 7-in. csg. at 3,775 ft.; comp.; no gauge.

Blue Ridge—Fort Bend County

San Jacinto Oil Co.'s No. 3 Blakely, 260 ft. due E of No. 5, 325 ft. W from center of road, Lot 8, Blk. E, E. Drew Sur.
Moving in.

Trans State Oil Co.'s No. 1-B Blakely, 100 ft. E of W line, 175 ft. N of S line Lot 4, Blk. G, E. Drew Sur.
Drlg. shale 3,110 ft.

Boling—Fort Bend County

Mack Hawk Oil Co.'s No. 2 E. C. Farmer, 867 ft. from NE line, 548 ft. from NW line of 50-ac. tract, J. Scott Sur.
T.D. 4,650 ft.; 7⅝-in. csg. at 4,400 ft.; W.O.C.

Texas Co.'s No. 14-A Taylor, 409 ft. NW of No. 13-A, 200 ft. NE of No. 9-A, S. F. Austin League.
Drlg. shale 2,746 ft.

Orchard—Fort Bend County

Gulf Prod. Co.'s No. 1-A J. M. Moore, 1,430 ft. W, 110 ft. N of SE cor. of sur. Durman Imigration A-177.
Drlg. shale 1,510 ft.

Gulf Prod. Co.'s No. 44 Moore, 500 ft. NW of No. 42, Leo Burknapp Sur.
Drlg. shale 3,510 ft.

Gulf Prod. Co.'s No. 43 Moore, 350 ft. E along S line of SW cor. of E.M.&G. Co. Sur. and 740 ft. N at R/A to said line of lease, 350 ft. E of No. 3 Moore.
Drlg. shale 7,210 ft.

Thompson—Fort Bend County

Gulf Prod. Co.—Humble Oil & Ref. Co.'s No. 26-A Booth, 921 ft. W of No. 23, 884 ft. N of S line of lease. S. Kennedy Sur.
Drlg. shale 4,910 ft.

High Island—Galveston County

Stanolind O. & G. Co.'s No. 1-C Marrs-McLean, 450 ft. S of N line of Lot 5, M. Dunman Sur.
M.I.R.

Stanolind O. & G. Co.'s No. 1-B Smith Royalty Acct., 200 ft. EW line, 1,660 ft. NS line, Susan Hope Sur. No. 3.
Drlg. sand and boulders at 1,393 ft.

Stanolind O. & G. Co.'s No. 50 Cade, 850 ft. WE line, 950 ft. NS line of 460-ac. tract, N. Fitzsimmons Sur.
Rig up.

Stanolind O. & G. Co.'s No. 51 Cade, 690 ft. SN line, 620 ft. WE line of 460-ac. tract, Fitzsimmons Sur.
Rig up.

Stanolind O. & G. Co.'s No. 49 Cade, 372 ft. from NW line, 150 ft. from NE line of N. Fitzsimmons Sur.
Drlg. oil sand 5,480 ft. (corrected).

Stanolind O. & G. Co.'s No. 4-A Taylor, 42.5 ft. from W line of 15.7-ac. tract, 120 ft. N of No. 1-A M. Dunman Sur.
T.D. 4,812 ft; P.B. and sidetracked at 4,285 ft.; washing.

Stanolind O. & G. Co.'s No. 48 Cade, 900 ft. SE and 150 ft. NE of SW corner Block 4, Fitzsimmons Survey.
T.D. 5,896 ft.; reaming 5,580 ft.

Dickinson—Galveston County

Coast Pet. Co.'s No. 2 Maco Stewart, 660 ft. due W of No. 1, 330 ft. NS line of lease, W. K. Wilson Sur.
10¾-in. csg. at 2,496 ft.; W.O.C.

Humble O. & R. Co.'s No. 3-B Stewart, 3,954 ft. S along E line from NE cor. and 577.2 ft. W at right angles, J. Sellers Sur.
Drlg. shale 1,950 ft., 13⅜-in. csg. at 1,903 ft.

Humble Oil & Ref. Co.'s No. 2 Townes, 933 ft. E of No. 1, 1,133 ft. W of E line, 3,604 ft. N along E line of SE cor. of B.B.B.&C. Sur.
T.D. 8,065 ft., cored sand and shale showing oil 8,004-54 ft.; 7-in. csg. at 8,030 ft.; W.O.C.

Humble O. & R. Co.'s No. 1-B Bayou Dev. Co., 500 ft. S of lake in NW cor. of lease, 600 ft. E of W line, John Sellers Sur.
Coring sand 8,371 ft.

Humble O. & R. Co.'s No. 1 San Leon Farm, 1,300 ft. N of N bank of Dickinson Bayou, 100 ft. E of EL of J. S. Jones Sur. in 300-ac. tract. A. Edwards Sur.
Drlg. shale 3,890 ft.; 10¾-in. csg. at 1,946 ft.

Humble Oil & Refg. Co.'s No. 6-A Maco Stewart, 6,087 ft. S of NE corner, 1,390 ft. W of E line and 1,390 ft. E of W line and 466 ft. N of S line of Stewart T.D. 8,611 ft.; 15 min. D.S.T. from 8,315-27 ft., ¼-in. choke, recovered 90 ft. of gas cut mud.

Humble O. & R. Co.'s No. 5-A Stewart, 466 ft. W of E line of Stewart "A" Lease, 5,500 ft. due S of No. 2-A Stewart, John Sellers Sur.
Rig.

Humble O. & R. Co.'s No. 1 E. E. Anderson, 375 ft. N of S line, and midway between E and W lines of Lot No. 4, John Sellers Sur.
Cemented 7-in. csg. at 9,121 ft.; W.O.C.

Pure Oil Co.'s No. 2 J. W. Shelar, 779 ft. N, 182 ft. W of N. I. Shelar, B.B.B. &C. Sur.
T.D. 8,481 ft.; P.B. 4,815-4,650 ft.; sidetracking at 7,281 ft.

Stanolind O. & G. Co.'s No. 3 State, 633 ft. SE of No. 1, 218 ft. N of S bank of Dickinson Bayou Sur., Tract No. 3.
Sidetracked at 7,347 ft. and cemented off fish.

Stanolind O. & G. Co.'s No. 2 State, 1,369 ft. E of No. 1 State.
Drlg. shale 7,758 ft.

Turman Oil Co.'s No. 2 Piazza, 231 ft. W of E line, 730 ft. S of N line, 945 ft. E of No. 1, J. S. Sherman Sur.
Location.

Arriola—Hardin County

Houston Oil Co.'s No. 6-X fee, 2,630 ft. from E line, 400 ft. SW of No. 5, E. Arriola Sur.
(O.W.D.D.); T.D. 3,402 ft.; making D.S.T.

Republic Oil C.'s No. 10 fee (old well). T.D. 4,212 ft.; sanded up; pulled tubing and rerunning.

Batson—Hardin County

D. & L. Prod. Co.'s No. 1 Hooks, 100 ft. S of N line, 300 ft. E of W line 26.75-ac. tract, W. Donoho Sur.
Drlg. shale 5,565 ft.

John Deering et al's No. 1 J. W. Whitley, 160 ft. SN line, 240 ft. EW line of 130-ac. tract, W. Donoho Sur.
Drlg. hard sand 700 ft.

Shell Pet. Corp.'s No. 2 Jackson, 190 ft. W EL, 395 ft. N of SL of lease, W. Donoho Sur.
Location.

Texas Co.'s No. 1 Christian, 100 ft. from W line, 350 ft. from N line of 26.45-ac. tract, W. Donoho Sur.
T.D. 4,980 ft.; P.B. 4,625 ft.; 7-in. csg. at 4,598 ft.; to test sand from 4,605-21 ft.

Saratoga—Hardin County

Fauntaine and Poggi's No. 1 Enloe and Teel, 600 ft. WE line, 100 ft. SN line of league, T. Gainer Sur.
Abandoned 2,029 ft.

Hines' No. 2 Caswell, 8,600 ft. N of S line, 1,376 ft. E of W line of B.B.B.&C.R.R. Co. Sur. No. 72.
Drlg. sand and pyrites at 3,478 ft.

Rio Bravo Oil Co.'s No. C-142, 480 ft. E of W line of 100-acre tract, J. F. Cotton Sur.
T.D. 927 ft.; set 40 ft. 7-in. of 4½-in. screen.

Pierce Junction—Harris County

J. S. Abercrombie et al's No. 7 John Ritter, 535 ft. E of W line, 156 ft. N, 17 deg. 42 ft. W at right angles, James Hamilton Sur.
Drlg. plugs at 1,060 ft.

Gulf Prod. Co.'s No. 11 H. C. Cain, 390 ft. from W line, thence 439 ft. at R/A to N line of 130-ac. tract, Jas. Hamilton Sur. No. 98.
Drlg. shale 6,210 ft.

Navarro Oil Co.'s No. 3-B Cain, Jas. Hamilton Sur.
T.D. 7,078 ft.; shale; heaved to 7,018 ft.; P.B. to 6,130 ft.; sidetracked and drilled at 5,554 ft.; twisted off D.S.; fishing.

Rio Bravo Oil Co.'s No. 1-A Settegast fee, on line between B.B.&C. and Joseph Kopman Sur., 350 ft. due W of SE cor. of Settegast 68.25-ac. tract on survey and property line.
Drlg. sandy lime 3,416 ft.

Rio Bravo Oil Co.'s No. 3 Rio Bravo, G.H.&S.A.R.R., 1,400 ft. EW line of survey, 10 ft. SN line at right angles, J. Hamilton Sur.
Drlg. sandy shale showing oil at 3,492 ft.

Humble—Harris County

Texas Co.'s No. 38 Koehler, 1,750 ft. N, 500 ft. E of SW cor. of the tract, J. B. Stevenson Sur.
T.D. 4,799 ft.; reaming.

Mykawa—Harris County

Danciger O. & R. Co.'s No. 4 Minnetex, 300 ft. WE line, 250 ft. SN line of Lot 192, Wm. Lovett Sur.
Drlg. below 4,800 ft.

West Prod. Co.'s No. 5 Irwin, 795 ft. SN line, 306 ft. WE line of lease, W. B. Walker Sur.
Moving in.

West Prod. Co.'s No. 2 Lobit, 402 ft. EW line, 200 ft. SN line, Lot 17, F. J. Rothas Sur.
T.D. 4,938 ft.; P.B. to 3,600 ft. to straighten hole.

West Prod. Co.'s No. 4 Irwin, 300 ft. EW line, 230 ft. SN line of lease, W. B. Walker Sur.
T.D. 4,381 ft.; I.P. 18 bbls. per hour.

South Houston—Harris County

Diadem Oil Co.'s No. 1 Mrs. Alice Dean, center of Lot 152, H.T.&B. Sur. No. 6, 141 ft. EW line, 100 ft. SN line of lot.
T.D. 4,060 ft., shale, 3 drill stem tests, failed from 3,945-4,055 ft.

Stanolind O. & G. Co.'s District 19, No. 1, center of Lot 8, Blk. 77.
Drlg. sandy shale 3,529 ft.

Stanolind O. & G. Co.'s District 21, center Lot 1, Blk. 62.
T.D. 125 ft.; 13⅜-in. csg. at 120 ft.

Stanolind O. & G. Co.'s District 22, No. 1, center of Lot 8, Blk. 71.
Drlg. shale 2,150 ft.

Stanolind O. & G. Co.'s District 27, No. 1, center Lot 1, Blk. 102.
Rig up.

Stanolind O. & G. Co.'s No. 1 Meadowbrook, 417 ft. at right angles from NE line, 417 ft. from center line of Berry Gully, 414 ft. NW along NE line and 417 ft. southwesterly at right angles.
Drlg. shale 5,150 ft.

Stanolind O. & G. Co.'s Drlg. District 5, No. 1, center of Lot No. 2, Blk. 7.
Drlg. sand 3,860 ft.

Stanolind O. & G. Co.'s Drlg. District 8, No. 1, center Lot 16, Blk. 32.
T.D. 1,820 ft.; 10¾-in. csg. at 1,816 ft.

Stanolind O. & G. Co.'s Drlg. District 10, center Lot 16, Blk. 38.
Drlg. sandy shale 4,065 ft.

Stanolind O. & G. Co.'s No. 1 fee, 330 ft. S, 300 ft. E of NW cor. of 20-ac. tract, H.T.&B. Sur. No. 5.
T.D. 5,629 ft.; 7-in. csg. at 4,885 ft.; W.O.C.

Stanolind O. & G. Co.'s No. 1 Ed Wells, C Lot 3, Blk. 146, 1,240 ft. E, 2,270 ft. N of No. 1, H.T.&B. Sur. No. 5.
Drlg. 5,504 ft.

Tomball—Harris County

Humble O. & R. Co.'s No. 8-B Quilter, 600 ft. N of S line, 1,267 ft. W of E line of tract, A. Senchal Sur.
Spudded.

Humble O. & R. Co.'s No. 1 Wilke, 466 ft. SN line, Lot 175, 311.5 ft. EW line, 466 ft. WE line, J. Pruitt Sur.
T.D. 5,570 ft., running 7-in. csg.

Humble O. & R. Co.'s No. 2-A Holderreith, 821 ft. southward at right angles to N line, 596 ft. NE of SW line, C. N. Pillot Sur.
T.D. 5,545 ft., 7-in. csg. at 5,539 ft.; W.O.C.

Humble O. & R. Co.'s No. 1 Mrs. Jessie Mahaffey, 550 ft. E of W line, 422 ft. N of S line of 132-ac. tract, Jesse Pruitt Sur.
T.D. 5,571 ft.; 7-in. csg. at 5,566 ft.

Humble O. & R. Co.'s No. 4 Rudel, 2,741 ft. NS line, 140 ft. W of most easterly E line, 639 ft. NE of No. 2, J. House Sur.
T.D. 5,600 ft.; 7-in. csg. at 5,596 ft.; I.P. 13.3 bbls. per hour, ¼-in. choke, T.P. 1,525 lbs., C.P. 1,775 lbs.

Humble O. & R. Co.'s No. 1 Michel, 491 ft. E of W line of Sur. and on line between lots 178 and 182 Tomball Townsite, J. Pruitt Sur.
Location.

Shell Pet. Corp.'s No. 4 Rudel, 1,266 ft. W of E line, 420 ft. from N and S lines of 20-ac. tract, J. Pruitt Sur.
T.D. 5,580 ft.; 7-in. csg. at 5,550 ft.; comp. for gas well, T.P. 2,100 lbs., C.P. 3,150 lbs.

Texas Co.'s No. 3 E. Hillegigeist, 1,829 ft. N, 430 ft. W from SW cor. of 100-acre lease and on a T99.8-ac. lease, J. House Sur.
Drlg. shale 957 ft.

Maurits-Jackson County

Shell Pet. Corp.'s No. 1-A T. N. Mauritz, 682 ft. S, 466 ft. W of NE cor. of 160-ac. lease, A. Kountz Sur.
Preparing to core at 5,700 ft.

Smith and McDannald's No. 1 Mauritz, 467 ft. WE line, 394 ft. NS line of survey, J. Cummings Sur., Abst. 236.
Drlg. shale 6,080 ft.

Texas Pacific Coal & Oil Co. and Venza Oil Co.'s No. 1 J. M. Rosborough, 330 ft. each way out of NW cor. of 416-ac. lease of M.C. Sur. No. 37.
Drlg. shale 3,242 ft.

Big Hill—Jefferson County

Stanolind O. & G. Co.'s No. 2-A Pipkin & Davis, 1,430 ft. SW of NE cor. of Pipkin & Davis lease along SE line of same and 50 ft. SE at right angles, William McFaddin Sur.
Drlg. shale and lime 6,403 ft.

Stanolind O. & G. Co.'s No. 1-B Pipkin & Davis, 2,225 ft. from E line and 2,385 ft. from N line of survey, Wm. McFadden Sur.
T.D. 8,500 ft.; reaming rat hole at 6,150 ft.

Fannett—Jefferson County

Blue Eagle Oil Co.'s No. 1 Junker, 50 ft. each way out of NW cor. of lease, W. H. Smith Sur.
T.D. 4,116 ft.; 7-in. csg. at 4,076 ft., washing in.

Gulf Prod. Co.'s No. 12-C Kirby, 1,234 ft. N, 2,333 ft. E from NE cor. of J. Eldridge Sur.
Rig up.

Gulf Prod. Co.'s No. 9 Burrell, 2,010 ft. N along W line of 232-ac. tract from SE cor. of Thomas 446-ac. tract, thence 350 ft. E at right angles, W. H. Smith Sur.
Drlg. shale 3,940 ft.

Cleveland—Liberty County

Gulf Prod. Co.'s No. 11-C Kirby, 1,034 ft. N, along W line of J. Pleasant Sur., from NE cor. of J. Eldridge Sur. and 1,400 ft. E at R/A to said line, J. Pleasant Sur.
T.D. 5,540 ft.; I.P. 449 bbls. P.L.O. per day; T.P. 1,425 lbs.

Esperson—Liberty County

General Crude Oil Co.'s No. 20 Esperson (workover).
T.D. 3,613 ft., reaming.

General Crude Oil Co.'s No. 3 Davis (O. W.D.D.)
T.D. 4,121 ft.; set screen, getting ready to bail.

General Crude's No. 1 Hlavaty, 467 ft. out of SE cor. of F. M. Gardner Sur.
Drlg. shale 8,181 ft.

Hankamer—Liberty County

Eastman-Ward's No. 1 R. E. Lee, 115 ft. from N line of lease and 76 ft. W of west bank of White Bayou, Geo. Stengler Sur.
S.D. 2,767 ft.; drlg. water well.

Eljean Oil Co.'s No. 2 Exxell, 600 ft. due W of No. 1, 130 ft. from N and S lines of Levi-Barrow Sur.
S.D. 4,346 ft.

Gulf Prod. Co.'s No. 5 Crow & Jacobs, 2,900 ft. N, 2,140 ft. E of SW cor. of 300-ac. lease, H.&T.C. Sur.
Drlg. shale 5,484 ft.

Wilson-Broach Oil Co.'s No. 3 McLean-Crook, 100 ft. NS line and EW line of 22-ac. tract, L. Barrow Sur.
Abandoned 4,617 ft.

Hull—Liberty County

Gulf Prod. Co.'s No. 111 Phoenix, 1,893 ft. S along W line from NW cor., 1,625 ft. E at R/A, J. Devore League.
Bldg. derrick.

Baggett and Hutcheson's No. 1 Nelson, 50 ft. N of S line, 76 ft. W of E line of Nelson 644-ac. tract.
T.D. 401 ft.; oil sand; I.P. 10 bbls. per day.

W. B. Flynn's No. 8-B Able, 50 ft. S, 300 ft. W of NE cor. of old Humble 10-ac. tract.
Drlg. rock 619 ft.

Republic Prod. Co.—Houston Oil Co.'s No. 158 Dolbear, 170 ft. NW of No. 99 and 250 ft. SW of No. 156, J. Devore League.
Drlg. sand shale 1,678 ft.

South Liberty—Liberty County

Sun Oil Co.'s No. 58 Mitchell, T.D. 1,011 ft.
Preparing to set csg. at 808 ft.

R. R. Lawrence's No. 1 Vandeventer.
Drlg. sand and biders, 930 ft.

W. S. Christian's No. 1 Chambers.
T.D. 675 ft., preparing to set 7-in. csg.

Markham—Matagorda County

Hamill & Hamill's No. 3 Kountze, 150 ft. due E of No. 2, Parker Sur.
Location.

Van Vleck—Matagorda County

Skelly Oil Co.'s No. 3 Cobb "B," 2,750 ft. from NW line, 2,900 ft. from SW line of M. Cummings Sur.
T.D. 8,708 ft.; drilled plugs to 8,228 ft.; going in hole to perforate and make D.S.T.

Skelly Oil Co.'s No. 1 Sally Johnson, 467 ft. W of E line, 395 ft. SN line of 27-ac. tract, M. Cummings Sur.
Drlg. hard shale and lime at 4,528 ft.

Skelly Oil Co.'s No. 1 Cobb, (work over)
Drilled plugs to 7,475 ft., perforated from 7,465-68 ft. with 10 shots, making D.S.T.

Conroe—Montgomery County

Humble O. & R. Co.'s No. 77-A South Texas Dev. Co., 933 ft. N of No. 76-A, 1,603 ft. NE of SW line Theodore Slade Sur.
T.D. 5,089 ft.; perforated csg.; swabbed 50 per cent oil and 50 per cent salt wtr.; shut down.

Malta Oil Co.'s No. 10 Falvey, (work over)
Pulling screen to work over.

Sun Oil Co.'s No. 23 Keystone Mills.
Rig up.

Sun Oil Co.'s No. 10 Keystone Mills.
Derrick.

Splendora—Montgomery County

Bryce McCandless et al's No. 1 Texas Long Leaf Lbr. Co., 330 ft. from N and E lines of the W½ of Blk. No. 8, Walker County School Land Sur.
Derrick.

Port Neches—Orange County

Texas Co.'s No. 11 Kuhn, 620 ft. N, 330 ft. E of SW cor. of 257.74-ac. tract, Mary E. Hall Sur.
Location.

Texas Co.'s No. 4-A Polk, 400 ft. N, 135 ft. E from SE cor. of Mary Hall Sur. No. 1, being in the T. J. Notgrass Sur.
T.D. 4,792 ft.; 9⅝-in. csg. at 4,769 ft.; pulling tubing.

Livingston—Polk County

Hawkeye Pet. Co.'s No. 1 Nelson, 330 ft. N of S line, 460 ft. E of W line of 300-ac. tract, A. Viesca Sur.
Drlg. shale 3,910 ft.

Humble O. & R. Co.'s No. 18 Granbury, 5,289 ft. SE of NW line, Sec. 10, 1,194 ft. SW of NE line, Sec. 10, A. Viesca Sur.
Drlg. sandy shale 224 ft.

Humble O. & R. Co.'s No. 17 Granbury, 4,238 ft. NW line, 1,275 ft. NE line of Sec. 10, A. Viesca Sur.
T.D. 4,232 ft.; top sand 4,220 ft.; 7-in. csg. at 4,218 ft.; I.P. 18 bbls. per hour, ¼-in. choke, T.P. 425 lbs.; C.P. 525 lbs.

Humble O. & R. Co.'s No. 16 Granbury, 1,399 ft. from NW and 466 ft. from NE lines of Block No. 11, A. Viesca Sur.
Location.

Kettle & Gronoski's No. 1 Kingsbury County Holding Corp. (workover).
Old T.D. 4,362 ft.; I.P. 18 bbls. fluid per hour, 90 per cent salt water.

Ownby-Shell Pet. Corp.'s No. 4 Pratt, 466 ft. out of NW cor. of 197-ac. lease, A. Viesca Sur.
Derrick.

Sun Oil Co.'s No. 9 Pratt, 660 ft. W of No. 6, 330 ft. S line of lease, A. Viesca Sur.
Drlg. shale 1,980 ft.; 10¾-in. csg. at 521 ft.

Tom O'Connor—Refugio County

Quintana Pet. Co.'s No. 32-A Thomas O'Connor, 5,250 ft. to W line, 933 ft. E of No. 7-A, 933 ft. N of No. 5-A, J. M. Swisher Sur., Sec. 4.
Comp., no report.

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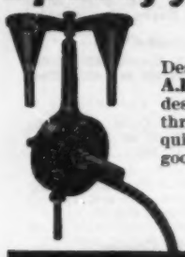

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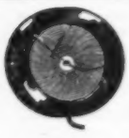

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Quintana Pet. Co.'s No. 23-A Thomas O'Connor, 4,500 ft. to E line, 1,500 ft. to NW line of J. M. Swisher Sur., Sec. 3. Comp., no report.

Colette Creek—Victoria County

Camp's No. 1 Kastner, 330 ft. from NE and SE lines of 52-ac. tract, Manchola Sur.
Coring for sand 2,794 ft.

Placedo—Victoria County

Barnsdall-Felmont Oil Co.'s No. 2 Pickering, 330 ft. NE of NE line of G.H.&S.A. R.R. Sur., Lot 1, Lander, Pickering and Traylor Subd. of the Mitchell Pastures, Black and Sanderson Sur.
T.D. 4,780 ft., made 23 min. D.S.T.; started flowing and flowed 22 min., ¼-in. choke on bottom, ⅝-in. on top, getting ready to set csg.

Barnsdall Oil Co.'s No. 1 Smith, 330 ft. from NW line, 420 ft. from railroad, A. Murey Sur.
T.D. 4,778 ft.; I.P. 183 bbls. per day, ¼-in. choke, 480 lbs. T.P., 500 lbs. C.P.

Eastern Texas Pet. Co.'s No. 1-A Schovajsa, 50 ft. NW of Costa's No. 1 Schovajsa, W. Ripley Sur.
Drlg. 3,150 ft.

J. McDowell's No. 1 Kirasek, center Blk. 45, Placedo Townsite.
T.D. 4,771 ft., 7-in. csg. at 4,758 ft.

C. F. McGrew's No. 1 Hadley, center of 20-ac. lot, S.A.&M.G. Sur., Sec. 9, Blk. 49, Lots 1 and 2.
Location.

Smith and Gulf Prod. Co.'s No. 1 Boehn, 330 ft. each way out of NE cor. of Lot 8, S.A.&M.G. Sur.
T.D. 4,777 ft.; I.P. 300 bbls. per day; T.P. 375 lbs., C.P. 200 lbs.

Sun Oil Co.'s No. 1 Schneider, 330 ft. from R.R., 330 ft. from SE line of Lot 132, NE offset to Sun's No. 2 Marek, S.A.& M.G. Sur.
Spudded.

Sun Oil Co.'s No. 2 Marek, 420 ft. from E line, 320 ft. from S line of J. M. Brownson Sur.
T.D. 4,773 ft; 7-in. csg. at 4,758 ft.; I.P. 18 bbls. per hour, 3/16-in. choke.

Westgate Oil Co.'s No. 1 Henderson and Pickering, 330 ft. each way out of SW cor. of Lot 76, S.A.&M.G. Sur.
T.D. 4,778 ft.; 7-in. csg. at 4,754 ft.; blew in, caught fire, still burning.

Clay Creek—Washington County

Joe Pamykol's No. 2 Clapp, 300 ft. NE of No. 1, 450 ft. SW line, 150 ft. NW line of lease, N. Clay Sur.
Skidding derrick to location.

Sun Oil Co.'s No. 11 Clay, 750 ft. NW line, 150 ft. SW line, 218-ac. tract, J. F. Perry Sur.
Rig up.

Sun Oil Co.'s No. 3 Theo Qeube, 450 ft. from SE line and 150 ft. from NE line of 68.3-ac. tract, J. T. Perry Sur.
Coring 867 ft.; no report.

Louise—Wharton County

Pure Oil Co.'s No. 1 H. F. Whiteside, 660 ft. NE and 330 ft. SE of W cor. of 80-ac. tract, M.&C. Sur., Sec. 19.
Coring shale 5,131 ft.

Pure Oil Co.'s No. 1-B Garrett, 506.47 ft. NE, 429.5 ft. SE from W cor. of Sur No. 27, Morris & Cummings Sur.
T.D. 6,448 ft.; 7-in. csg. at 6,438 ft.

Pickett Ridge—Wharton County

Texas Co.'s No. 4-A Pierce, 1,980 ft. S, 32 degrees E from Pierce No. 3-A H.& G.N. Sur., Sec. 38.
Drlg. shale 4,641 ft.

Texas Co.'s No. 5-A Pierce, 1,320 ft. N, 58 deg. E, 660 ft. S, 32 deg. E from No. 3-A, I.&G.N. Sur. No. 36.
T.D. 606 ft.; 16-in. csg. at 32 ft.

SOUTH LOUISIANA FIELDS

Black Bayou—Cameron Parish

Shell Pet Corp.'s No. 27 Watkins, 1,921 ft. S, 179 ft. E of NW cor. of Sec. 17-12s-12w.
T.D. 4,422 ft. oil sand, S.D.

Shell Pet. Corp.'s No. 28 Watkins, 1,929 ft. S, 925 ft. E of NW cor. of Sec. 17-12s-12w.
10¾-in. csg. at 1,321 ft.; W.O.C.

Shell Pet. Corp.'s No. 26 Watkins, 2,380 ft. W, 100 ft. S of NE cor. of Sec. 18-12s-12w.
Location.

Shell Pet. Corp.'s No. 24 Watkins, 2,833 ft. W, 695 ft. S of NW cor. Sec. 18-12-12.
S.D. 4,538 ft.

Bay St. Elaine

Texas Co.'s No. 3 School Board, Sec. 16-22s-18e.
Abandoned location.

Caillou Island—Terrebonne Parish

Texas Co.'s No. 24 Caillou Island, Sec. 17-23s-20e.
12¾-in. csg. at 1,311 ft., W.O.C.

Texas Co.'s No. 1 State Terrebonne Bay, Sec. 19-23s-20e.
T.D. 6,017 ft.; P.B. to 5,016 ft. and stuck drill stem while reaming to 4,811 ft.; fishing.

Texas Co.'s No. 27 State, Sec. 17-23s-20e.
T.D. 5,674 ft.; abandoned in sidetracked hole at 2,482 ft.

Bosco—Acadia Parish

Superior Oil Co.'s No. 11 Larcade, 2,119 ft. E, 100 ft. S of NW cor. of Sur. 35.
Drlg. sand and shale 7,825 ft.

Tepetate—Acadia Parish

Continental Oil Co.'s No. 1 Federal Land Bank, cen. of S½ of NW¼, NW¼ Sec. 28-7s-2w.
T.D. 8,317 ft.; 7-in. csg. 8,317 ft.; I.P. 515 bbls. per day, ¼-in. choke, T.P. 2,300 lbs., C.P. 2,025 lbs.

Continental Oil Co.'s No. 1 Henry Klumpp, 660 ft. W, 330 ft. S of NE cor. of Sec. 34, Twp. 7s-2w.
T.D. 9,000 ft.; P.B. and set 7-in. csg. at 8,442 ft.; W.O.C.; showed mud and some gas on D.S. test 8,334-60 ft.; P.B. to 8,300 ft.

Continental Oil Co.'s No. 1 Homeseekers Dev. Co., 3,300 ft. W, 2,640 ft. N of SE cor. of Sec. 29-7s-2w.
T.D. 8,800 ft.; 7-in. csg. 8,617 ft.; perforated csg. from 8,513-31 ft.; showed 157 l. s. pressure, 5 thribble oil, 5 thribbles salt water.

Darrow—Ascension Parish

Humble O. & R. Co.'s No. 8 Gumble, 505 ft. SW of No. 6, 1,147 ft. SE of No. 2, Sec. 31-10s-2e.
T.D. 2,025 ft.; 10¾-in. csg. at 2,021 ft.

Humble O. & R. Co.'s No. 4 Gumble, 323 ft. at right angles to SW line of 121.9-ac. tract and 541 ft. SE from No. 3, Sec. 33-10s-2e.
Drlg. salt 6,645 ft., top salt 6,023 ft.

Sorrento—Ascension Parish

Athens Oil Co.'s No. 3 United Land, 400 ft. W of No. 2, Sec. 15-10s-4e.
Location.

Cameron Meadows—Cameron Parish

Magnolia Pet. Co.'s No. 15 Cameron Meadows, 1,700 ft. W, 650 ft. S of NE cor. of NE¼ of Sec. 21-14s-13w.
Drlg. shale 275 ft.

Burton Sutton Oil Co.'s No. 9 School Land, 551 ft. N of S line, 293 ft. W of E line of Sec. 16-14s-13w.
Drlg. sand 2,930 ft.

Burton Sutton Oil Co.'s No. 4 School Land, Sec. 16-14s-13w.
Derrick.

Choctaw Dome—Iberville Parish

Standard Oil Co.'s No. 6 Gay, 400 ft. N, 50 ft. W of No. 5, Sec. 52-9s-11e.
Location.

Zeni Oil Co.'s No. 1 Schwing, Sec. 19-17s-24e.
T.D. 6,163 ft.; P.B. to 1,500 ft.; preparing to sidetrack.

Dog Lake—Terrebonne Parish

Texas Co.'s No. 11 State, 1,100 ft. N, 2,476 ft. W of SE cor. of Sec. 21-21s-16e.
S.D. 2,014 ft.

Four Isle—Terrebonne Parish

Texas Co.'s No. 6 State, 1,923 ft. S, 2,100 ft. W of NE cor. of Sec. 23-21s-16.
Drlg. sand 5,742 ft.

Texas Co.'s No. 8 La. Land & Expl. Co., 2,177 ft. E, 1,385 ft. S of NW cor. Sec. 24-21s-16e.
Drlg. shale 6,177 ft.

Texas Co.'s No. 5 State, 885 ft. S, 2,327 ft. E of NW cor. of Sec. 24-21s-16e.
Location.

Garden Island Bay—Plaquemines Parish

Texas Co.'s No. 17 State, 1,970 ft. N, 1,648 ft. E of SW cor. of Sec. 37-23s-33e.
Location.

Texas Co.'s No. 13 State, 1,268 ft. N, 2,318 ft. E of SW cor. of Sec. 37-23s-33e.
Location.

Texas Co.'s No. 12 State, 3,391 ft. S and 1,604 ft. W of NE cor. Sec. 107-23-32.
Rig up.

Gillis—Calcasieu Parish

Fohs Oil Co.'s No. 8 Castle, 275 ft. N and E of SW cor. NE¼ of SE¼ Sec. 14-9s-8w.
Drlg. shale at 2,550 ft.

Fohs Oil Co.'s No. 7 Castle, 1,115 ft. S, 350 ft. E of NW cor. of NW cor. of NW¼ of SE¼ Sec. 14-9s-8w.
Cemented 7-in. csg. at 7,064 ft.

Union Sulphur's No. 5 Barbe, 1,160 ft. W, 589 ft. N of SE cor. of NE¼ Sec. 11-9s-8w.
Drlg. shale 3,839 ft.

Union Sulphur's No. 14 State, 1,462 ft. N, 69 ft. W of SE cor. NE¼ Sec. 11-9s-8w.
Location.

Union Sulphur's No. 4 Powell, 585 ft. S, 1,621 ft. E of NW cor. of Sec. 12-9s-8w.
Derrick.

Union Sulphur Co.'s No. 4 Barbe, 996 ft. N, 329 ft. W of SE cor. of NE¼ Sec. 11-9s-8w.
T.D. 6,776 ft.; P.B. to 6,664 ft. and sidetracked, coring new hole.

Union Sulphur Co.'s No. 4 Reeves, 950 ft. W, 290 ft. S of NE cor. of SW¼, NW¼ Sec. 12-9s-8w.
Drlg. shale 6,511 ft.

Union Sulphur Co.'s No. 3 Castle.
T.D. 5,182 ft.; top sand 5,172 ft.; I.P. 336 bbls. in 16 hours; now flowing 24 bbls. fluid per hour through 18/64-in. choke, 70 per cent salt water.

Union Sulphur Co.'s No. 7 State, 1,316 ft. N, 199 ft. E of SW cor. Sec. 13-9s-8w.
Location.

Union Sulphur Co.'s No. 12 State, 2,310 ft. N, 1,650 ft. E of SW cor. of Sec. 13-9s-8w.
T.D. 7,694 ft.; P.B. 7,545 ft.; cleaned hole and perforated csg. at 7,554-59 ft., came in wild, trying to kill.

Union Sulphur Co.'s No. 13 State, 1,464 ft. E, 2,088 ft. N of SW cor. of Sec. 13-9s-8w.
Location.

Gueydan—Vermilion Parish

Pure Oil Co.'s No. 6 Alliance Trust, 667 ft. E, 1,787 ft. S line of lease, Sec. 34-11s-1w.
T.D. 9,545 ft.; P.B. to 9,220 ft.; preparing to pull liner to test upper sand.

Hackberry—Cameron Parish

Calcasieu Oil Co.'s No. 5 Hanzen, 2,520 ft W, 803 ft. S of NE cor. of Sec. 14-12s-10w.
Drlg. shale and lime 5,894 ft.

Gulf Refg. Co.'s No. 19 Erwin, 1,315 ft. W along S line of the SE cor. of Sec. and 960 ft. at R/A to S line, Sec. 13-12-10w.
Drlg. shale 7,831 ft.

Stanolind O. & G. Co.'s No. 15 Gulf Land, 1,650 ft. S, 750 ft. W from NE cor. SW¼ of Sec. 14-12s-10w.
Rig up.

Texas Co.'s No. 13 State, N 13 deg. 20 ft. W, 4,000 ft. from No. 12, Sec. 44-12s-9w.
Spudded.

New Iberia—Iberia Parish

Canal Oil Co.'s No. 2 Sabatier et al, 200 ft. NE along lease line from W cor. of Canal-Bernard lease in Sec. 54, thence NW at right angles of Sec. 53-12s-7e.
T.D. 2,802 ft.; preparing to make D.S.T.

Harrison & Abercrombie's No. 4 Schwing, Sec. 56-12s-7e.
Cutting and pulling screen at 6,789 ft.

Kitos Oil Co.'s No. 1 Sealy, Sec. 56-12s-7e.
Derrick.

Jennings—Acadia Parish

Abshire-Bolyard's No. 3 Clemonds, 3,500 ft. N, 95 ft. E of SW cor. Sec. 46.
T.D. 2,039 ft.; pumped 25 bbls. net oil, 50 per cent salt wtr.; S.D.

Yount Lee Oil Co.'s No. 15 Houssiere-Latriele.
Drlg. shale and shells at 6,487 ft.

Lafitte—Jefferson Parish

Texas Co.'s No. 2 Rigolet Co-operative Co., 467 ft. S, 1,194 ft. W of NE cor. Sec. 30-19s-24e.
Driving piling.

Lake Hermitage—Plaquemines Parish

Humble O. & R. Co.'s No. 1 State Land, 1,080 ft. E, 200 ft. N of Texas Gulf No. 6, Sec. 11-18s-25e.
T.D. 4,402 ft.; P.B. to 2,930 ft.; coring shale 3,599 ft.

Lake Barre—Terrebonne Parish

Texas Co.'s No. 34 State, Sec. 40-21s-19e.
10¾-in. csg. at 915 ft.; sand 1,544 ft.

Lake Pelto—Terrebonne Parish

Texas Co.'s No. 14 State, Sec. 8-23s-18e.
Drlg. sand and shale 5,491 ft.

Leesville—Lafourche Parish

Texas Co.'s No. 39 Leesville, 125 ft. S, 1,481 ft. W of NE cor. SE¼ of Sec. 27-21s-22e.
Derrick.

Texas Co.'s No. 38 L.L.&E., 201 ft. W and 292 ft. S of NE cor. of SE¼ of Sec. 27-21s-22e.
T.D. 4,037 ft.; 7⅝-in. csg. at 3,991 ft.

Texas Co.'s No. 25 Leesville.
Derrick.

Texas Co.'s No. 23 Leesville, 975 ft. S, 1,975 ft. W of NW cor. of SW¼ Sec. 26-21-22.
Derrick.

Texas Co.'s No. 32 Leesville, 890 ft. S, 2,484 ft. W of NE cor. SE¼ Sec. 27-21s-22e.
Drlg. sandy lime 4,273 ft.

Lockport—Calcasieu Parish

Magnolia Pet. Co.'s No. 10 Farquhar, 200 ft. S, 200 ft. E of NW cor. SE¼ SE Sec. 8-10s-9w.
Drlg. sandy shale 5,290 ft.

Roanoke—Jefferson Davis Parish

Glassel et al's No. 1 La. Irrigation Mill Co., 695.5 ft. E and 475 ft. N of SW cor Sec. 1-9s-4w.
Location.

Humble O. & R. Co.'s No. 4 Kratzer, 75 ft. SN line, 375 ft. WE line of Sec. 11-4w-9s.
Drlg. sandy shale 3,050 ft., 10¾-in. csg. at 3,022 ft.

Humble O. & R. Co.'s No. 3 Kratzer, 1,333 ft. NS line, 440 ft. WE line of M. Kratzer 120-ac. tract, Sec. 11-9s-4w.
Drlg. shale and lime 6,703 ft.

Sweet Lake—Calcasieu Parish

Pure Oil Co.'s No. 13 Yount Lee, 800 ft S, 66 deg. 42 ft. E of No. 12, Sec. 18-12-13.
T.D. 7,366 ft., coming out with core from 7,363-66 ft.

Sulphur—Calcasieu Parish

Union Sulphur Co.'s No. 814 fee, 2,666 ft. N, 411 ft. W of Center Sec. 29-9s-10w.
T.D. 3,425 ft., 7-in. csg. at 3,239 ft., W.O.C.

Union Sulphur Co.'s No. 813 fee, 1,995 ft. S, 90 ft. E of NW cor. of Sec. 29-9s-10w.
T.D. 5,309 ft.; 7-in. csg. at 5,134 ft.; I.P. 1,900 bbls. P.L.O. per day, 20/64-in. choke; T.P. 575 lbs.

White Castle—Iberville Parish

Shell Pet. Corp.'s No. 2 Shingle, 250 ft. S, 275 ft. E of NW cor. of Shingle lease. Bldg. roads.

Shell Pet. Corp.'s No. 8 Wilbert.
Oil sand 6,042 ft.

Shell Pet. Corp.'s No. 1 Adams, 2,340 ft. N 100 ft. E of SW cor. of lease.
T.D. 8,942 ft.; flowing by heads.

Miscellaneous Wildcats

TEXAS

Austin County

T. F. Wood et al's No. 1 Trenchman, 330 ft. from SE line of a 50-ac. tract, James Cummins Sur.
S.D. 750 ft.

Brazoria County

British-American Oil Prod. Co.'s No. 1 W R. Nash, 1,191 ft. E of W line, 335 ft. S of N line of Thos. Alsberry League.
Drlg. shale 1,310 ft.

Gulf Prod. Co.'s No. 1 Wilkes & Smith, 5,510 ft. W along N line of 350-ac. tract from NW cor. of 211-ac. tract, thence 990 ft. S at R/A James Hall Sur.
Rig up.

R. R. Osborne's No. 1 John L. Jones 330 ft. each way out of N cor. of S½ of Lot 7, Blk. 1, J. C. Smith Sur.
S.D. 20 ft.

Texas Co.'s No. 2 Freeport Sulphur Co., Conception Arcola Sur.
Reaming 1,016 ft.

Burleson County

Carl Dyer et al's No. 1 C. W. Young, 750 ft. EW line, 330 ft. SN line of 140-ac tract, John Byrd Sur.
Preparing to set surface csg. at 60 ft.

Chambers County

Black Gold Oil Co.'s No. 1 Borrow, 6,433 ft. NW of the SE line, 3,080 ft. SW of NE line, Ruben Borrow Sur.
Rig up.

Salt Dome Oil Co.'s No. 1 A. B. Lawrence, James Grant Sur., 2,650 ft. NW of SE line, 6,060 ft. SW of NE line.
Drlg. shale 6,545 ft.

South Gulf Oil Co.'s No. 1 J. T. White, 1,653 ft. from E line, 466 ft. from S line of 1,476-ac. tract, James McGahey Sur.
Location.

Stanolind O. & G. Co.'s No. 1 A. B. Middleton, 426 ft. from W line, 466 ft. from S line of A. D. Middleton 120-ac. tract, Shadrock Burney Sur.
Location.

Calhoun County

Continental Oil Co.'s No. 2 American National Realty Co., 660 ft. from NW line, 666 ft. from NE line of Sec. 6, Blk. C, Pedro Garcia Sur.
Cut 6-in. csg. 7,114 ft.; will sidetrack.

Humble O. & R. Co.'s No. 1 Mrs. Eliza Welder, 5,685 ft. S, 55 deg. W from a part of intersection of St. L.B.&W. R.R. Sur. and NW line of Jose Maria Rios Sur., 7,210 ft. S, 35 deg. E at R/A Gardner Smith Sur.
Moving in.

Colorado County

Coyle & Concord's No. 1 fee, 550 ft. from N line, 1,950 ft. from E line of Sec. 45. I.&G.N. Sur.
10¾-in. csg. 610 ft.; T.D. 698 ft.

Fort Bend County

Hunte O. & G. Co.'s No. 1 A. P. George, 4,132 ft. NW along SW line from S cor. of survey, thence due N 1,330 ft., thence due E 2,970 ft., thence due N 330 ft. to location, approx. 2,100 ft. NW along SW line from S cor. of survey and 2,750 ft. NE at right angles, J. Jones Sur.
W.O.C. 650 ft.

Texas Gulf Prod. Co.'s No. 1 K. B. Winston, 1,490 ft. E of W line, 238 ft. N of S line of 350-ac. tract, S. Isaacs Sur.
Drlg. shale 6,400 ft.

Galveston County

Sun Oil Co.'s No. 1 J. D. Hughes, 1,660.9 ft. NW line, 1,212 ft. NE line of W. M. C. Baker Sur.
Rig up.

Grimes County

Dr. Marshall et al's No. 1-B Todd, 300 ft. from E line and 175 ft. from N line of 150-ac. tract in extreme NW cor. of county (25 ft. N of No. 1).
7-in. csg. 2,678 ft.; T.D. 2,815 ft.; could not bail fluid down in csg.; bailing.

Harris County

Cockburn Oil Co. and Stanolind O. & G. Co.'s No. 1 J. B. Hines, 7,817 ft. NS line and 330 ft. EW line of survey, A. McCormick Sur.
Drlg. shale 5,630 ft.

A. C. Hill's No. 1-A Swilley 5,426 varas E of W line and 1,960 varas N of S line of Sur.-C. Victor Blanco Sur.
Rig up.

A. C. Hill's No. 1-B Swilley 6,141 varas E of W line, 1,960 varas N of S line of Sur., center of 200-ac. lease, 365 varas S of N line and 773 varas W of E line of lease, Victor Blanco Sur.
Bldg. roads.

E. E. Young, tr.'s No. 2 P. S. Griffith, 2,476 ft. S of N line, 2,030 ft. E of W line of A. R. Bodman Sur.
S.D. 4,275 ft.

Hardin County

Frank Beaudoin et al's No. 1 Walton, A. L. Lancaster Sur.
S.D. 1,900 ft.

Houston County

A. H. Smith et al's No. 1 Smith Bros., S 55 deg., W 973 ft., S 36¾ deg., E 1,409 ft., J. H. Cummings League.
8¼-in. csg. at 420 ft., drlg. shale 600 ft.

Zeni Oil Co.'s No. 1 Houston County Timber Co., I.&G.N. Sur.
Drlg. shale 3,290 ft.

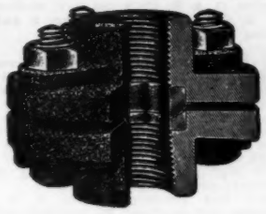
Jackson County

L. A. Douglas' No. 1 I. N. Mitchel, 750 ft. W, 150 ft. N from NW cor. of A. F. Mitchell 100-ac. tract, Lolita area, S. F. Austin Sur.
Moving in.

Jefferson County

Jack Frazier et al's No. 1 A. Oswald,

DART UNIONS AND FLANGES



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WILLIAMSPORT, PA.

372 ft. N and E line of Oswald 102.6-ac. tract, M. Pevitot Sur.
Abandoned 7,525 ft.

Humble O. & R. Co.'s No. 1 R. C. Miller et al, 1,399 ft. S, 460 ft. W from NE cor. of Blk. No. 7, Garden Villas Subd., approx. 6,650 ft. WE line, 5,500 ft. NS line of survey, A. Savery Sur.
T.D. 230 ft., set 10-in. csg. at 197 ft.

Humble O. & R. Co.'s No. 1-B McFaddin, C. T. Cade Sur., 330 ft. from S and W lines of the E 240-ac. tract.
Drlg. shale 4,709 ft.

Sun Oil Co.'s No. 1 Herbert & Braussard, 6,590 ft. NW along SW line and 660 ft. NE at R/A to SW line, B. Blackman Sur., Abst. No. 2.
Shale 8,282 ft.; 9⅝-in. csg. 8,210 ft.; flowed S.W.; ¼-in. choke; C.P. 2,700 lbs.; T.P. 600 to 700 lbs.; flowed 800 bbls. in 18 hrs; S.W. light show of oil; T.P. 950 lbs., killed well, laying down tubing, circulating mud.

Tatum and Pendergrass No. 1 B. W. Owens, 160 ft. E of W line and 225 ft. S of N line of Lot No. 3, Blk. 9, Range 9, Port Arthur Land Co. subdv., Joseph Grigsley Sur.
Drlg. sandy shale 823 ft.

Matagorda County

Continental Oil Co.'s No. 1 Felfe, J. S. Criswell Sur., 3,000 ft. E of W line, 2,800 ft. N of S line of survey.
T.D. 6,072 ft.; going in hole with special csg. to resume drilling.

Hammon Exploration Co.'s No. 1 Cleveland, 330 ft. NS line, and WE line of 68-ac. tract, E. Hall Sur.
Drlg. lime and shale at 2,575 ft.

Helmerich & Payne's No. 1 Hawkins, 850 ft. S, 70 deg. W of Cockburn Oil Co.'s No. 6 Hawkins.
Drlg. shale 6,300 ft.

Horace M. Smith, Inc.'s No. 1 Wadsworth ranch, 150 ft. out of S cor. of Lot No. 8, S. R. Fisher Sur.
T.D. 3,853 ft.; ran screen and liner, showed considerable oil while pumping down screen, preparing to test.

Sterling O. & R. Co.'s No. 1 Baer Estate, 5,274 ft. SW of S cor. of Van Dorn and Bales Sur., 400 ft. NW at right angles in Samuel Hart Sur.
T. D. 1,820 ft.; 10¾-in. csg. set at 1,820 ft.; W.O.C.

Sun Oil Co.'s No. 1 Craig, 1,546.9 ft. SW from N cor. along NW line of lease and survey, thence 157.2 ft. SE at right angles in Thomas Williams Sur.
T.D. 258 ft.; pulling 18⅝-in. csg.

Montgomery County

W. M. S. Thomson's No. 1 Scott, 1,191 ft. SN line, 482 ft. WE line, 1,623 ft. EW line of the F. A. B. Wheeler Sur.
T.D. 3,674 ft., preparing to set csg. at 3,350 ft.

Orange County

Blue Line Oil Co.'s No. 1 J. E. Peet Richard, 900 ft. W of E line and 150 ft. S of N line of most easterly NE cor. of 138-ac. tract. Ballou Sur.
Drlg. shale 1,954 ft.

Coker Oil Co.'s No. 1 S. T. Mansfield, 500 ft. S, 500 ft. W from NE cor. of 50-ac. tract, J. W. Hall Sur.
S.D. 1,280 ft.

Smith & Ellis' No. 1 Pell.
T.D. 2,095 ft.; changing rigs.

Polk County

Perry Morgan et al's No. 1 K. H. Root, L. Costillian Sur.
T.D. 28 ft.; S.D.

Refugio County

Cecil Hagen et al's No. 1 Edith Clarkson, 1,736 ft. from N line, 3,820 ft. from E line of J. Coughlin Sur.
Location.

San Jacinto County

Cockburn Oil Corp.'s No. 1 H. H. Lockin, 2,214 ft. W of E line, 295 ft. S of N line of H. H. Lockin 1,954-ac. tract, W. M. Hayes Sur.
Location.

J. E. Hooper et al's No. 1 R. B. Love, 475 S of N line, 2,000 ft. W of E line, 177-ac. tract, Drury McGee Sur.
Building rig.

Victoria County

Heep Oil Corp.'s No. 1 J. J. Welder, 300 ft. SW line, 750 ft. from SE line of Nursery area, Phillip Graves Sur.
Location.

Shell Pet. Corp.'s No. 2 McFadden, 11,250 ft. from NE cor. along N line, 2,310 ft. S of N line at R/A.
Location.

Welder Oil & Gas Co.'s No. 1 Patrick, 3,230 ft. SW, 1,925 ft. NW of most easterly cor. of 1,736-ac. tract, Felipe Dem-mit Sur.
Spudded.

Wharton County

Pure Oil Co.'s No. 1 Paige, 1,397 ft. NE and 467 ft. SE from W cor. of 159.27-ac. lease, James Pirie Sur.
T.D. 5,972 ft., reaming, made D.S.T. at 5,783 ft.; recovered 5 stands drlg. mud and 27 stands of salt water.

Sterling Oil & Ref. Co.'s No. 1 Frank Janik Sr., 1,859 ft. from N line, 467 ft W from SE cor. of Janik tract, Johathan Scott Sur.
T.D. 8,667 ft.; 5-in. csg. at 7,831 ft.; flowed salt wtr. with very small show of gas; reaming cmt. out of csg.; S.D.

Texas Co.'s No. 1-C Pierce Est., 12,225 ft. W along S line of the W. M. Pettus Sur., 3,400 ft. N in the John Caldwell League.
T.D. 6,088 ft.; cored from 6,078-85 ft.; now reaming.

SOUTH LOUISIANA

Beauregard Parish

Richardson & Martin's No. 1 Southwest Lbr. Co.
Location.

Calcasieu Parish

Fred Oil Co.'s No. 2 Faist, 262 ft. E and 8 ft. S of NW cor. SE¼ Sec. 26-8s-10w.
S.D. 4,051 ft.

Wheeler Oil Corp.'s No. 1 School Lot, 1,708 ft. E, 1,325 ft. N of SW cor. Sec. 16-9s-7w.
Drlg. shale 6,950 ft.

Cameron Parish

Magnolia Pet. Co.'s No. 1 J. B. Broussard, 330 ft. E and S, out of NW cor. of the SW¼ of SE¼ of Sec. 13-12s-9w.
Drlg. hard sand 9,053 ft.

Steinberger Pet. Co.'s No. 1 Drew, 330 ft. out of NW cor. NE¼ of Sec. 26-10s-11w.
Location.

Evangeline Parish

J. E. Ladue's No. 4 Vidrien, Sec. 34-3-3.
S.D. 1,635 ft.

Sparks-Mitchell and Jacobson's No. 1 Vidrine, 1,114 ft. S, 1,060 ft. W of NE cor. Sec. 47-4s-2e.
Shale 1,618 ft.; no report.

East Feliciana Parish

Thompson Creek Oil Co.'s No. 1 Fannie Noland, 2,600 ft. E and 1,580 ft. N of SW cor. Sec. 70.
S.D. 1,589 ft.

Iberia Parish

Jefferson Lake Oil Co.'s No. 1 State, Twp. 12s-5e.
T.D. 8,444 ft.; cutting and pulling stuck drill stem at 7,145 ft.

Meade Oil Co.'s No. 1 Hamilton, near town of Loze, in the NW cor. of parish, Sec. 38-12-5.
S.D. 200 ft.

Texas Co.'s No. 1 State Fausse Point.
Drill stem stuck at 6,400 ft.; fishing.

Jefferson Davis Parish

Shell Pet. Corp.'s No. 1 Lacassan, 990 ft. N, 1,980 ft. E of SW cor. of Sec. 20-11s, 5w.
Coring sand 6,214 ft.

LaFourche Parish

Coastal Oil Co.'s No. 2 Constantine, 1,476 ft. N, 809 ft. E of SW cor. Sec. 26-21-22e.
Location.

St. Bernard Parish

F. F. Kramer's No. 1 Robinson, 200 ft. S, 200 ft. W of NE cor. of Sec. 78-14s-14e.
T.D. 100 ft.; reported slight gas show, shut down.

Emerald Pet. Corp.'s "Shell Beach Properties" No. 1, on S edge of Bayou Louis, Sec. 31-13s-15e.
T.D. 7,385 ft.; hole caved in while S.D. at 5,480 ft.; cemented 7-in. csg. at 5,480 ft.

St. Mary Parish

Herton Oil Co.'s No. 1 Roame, 1,386 ft. N, 688 ft. E, SW cor. of Lot 13, Sec. 38-13s-9e.
Drlg. shale 2,900 ft.

St. Martin Parish

Texas Co.'s No. 1 State Lake, 5,180 ft. E 350 ft. N of SW cor. of Sec. 10-10s-9e.
Drlg. shale 5,429 ft.

Tide Water Oil Co.'s No. 1 Smedes, 990 ft. from N and E lines of 1,000-ac. tract Sec. 57-11e-6w.
T.D. 5,542 ft., will probably run 7-in. csg. to test.

Plaquemines Parish

Lo-Tex Expltn. Co.'s No. 1 Hero Plantation, Sec. 72-14s-24e.
5,343 ft., shut down.

Southern Sulphur Co.'s No. 1 Manhattan Fruit Co.
Drlg. shale with oil and gas odor at 2,999 ft.

Rapides Parish

Amerada Pet. Corp.'s No. 1 Wells Land Co., 490 ft. from W line, 2,450 ft. from S line of Sec. 53-1s-2e.
Drlg. lime 6,618 ft.

St. Tammy Parish

Danciger O. & R. Co.'s No. 1 Holdsworth, C NW¼ SE¼ Sec. 26-8s-14e.
T.D. 1,152 ft.; 18⅝-in. csg. at 67 ft.; W.O.C.

Vermillion Parish

Delcambre & Shelton's No. 1 Adam Delcambre, south degrees E. 825 ft. from most northerly cor. of irregular Sec. 63-17-5.
S.D. 2,521 ft.

Terrebonne Parish

Dulac Oil Co.'s No. 1 Bourg, Sec. 10-20-17e.
S.D. 4,072 ft.

Shell Pet. Corp.'s No. 1 Realty Operators, 2,000 ft. due S of E cor. of triangular Sec. 76, Sur. 103, 17s-17e.
Rig up.

E. C. TEXAS WILDCATS

Week Ending November 2

Cayuga Area—Anderson County

Tide Water Oil Co. et al's No. 21-A Willis 4,079 ft. N and 2,333 ft. W of lease, B. Edmondson Sur. (Trinity test).
T.D. 9,085 ft.; P.B. to 8,746 ft.; perforated csg. 8,040-8,110 ft.; to plug back.

Angelina County

Burnham et al's No. 1 Norton Properties, 700 ft. NW cor. and 600 ft. from E of W. M. Johnson Sur., 8 miles SW of Zavala in SE part of county.
S.D. 612 ft.

D. J. Le Blanc's No. 2 C. L. Dupuy, 800 ft. from S and 500 ft. from E of NW cor. of Blk. 48, H.T.&B. Sur., 4½ miles S of Huntington.
Drlg. 1,027 ft.

Pioneer Exp. Co.'s No. 1 J. A. Rose, 300 ft. SE and 200 NE of J. H. White 80-ac. tract, Sarah O'dell Sur.
S.D. 1,209 ft.

Pioneer Exploration Co.'s No. 1 Mrs. Willroy, 700 ft. N line of D. C. Welsh Sur., and center of E and W lines of Sur., ¼ mile NW of Huntington.
Elev. 312 ft.; S.D. 1,429 ft.; making about 12 bbls. per day; gr. 25 deg.

Bowie County

Tex-Ark. Oil Co.'s No. 1 Hamilton Estate, 600 ft E and 350 ft. N lines, J. Milan Sur., 4 miles S of Red River.
S.D. 1,121 ft.

Woodley & Bentley's No. 1 Lumpkin, 330 ft. out of NE cor. of 245-ac. tract, J. McDermot Sur., 1 mile SW of Dalby Springs.
S.D. 120 ft.

Camp County

E. J. Moran's No. 1 Wm. Mitcham Est., 660 ft. from N and W of 160-ac. tract, L. Rose Sur., 2 miles N of Newsome.
Elev. 443 ft., S.D. 2,520 ft.

E. R. Smith et al's No. 1 J. M. Jordan, 3,000 ft. from S and 1,100 ft. from E, B. Allen Sur., 1 mile S of Newsome.
Elev. 438 ft.; top Woodbine 4,267-83 ft.; S.D. 4,335 ft.

Cherokee County

Wilson Stubbs Oil Co.'s No. 1 Rowborts, 450 ft. from S line, 150 ft. from W line of 100-ac. tract, 2 miles SW of Jacksonville, J. D. Wolfin Sur.
S.D. 1,553 ft.

Collin County

Port Bolivar O. & R. Co.'s No. 1-A Dunning, 24 ft. W of No. 1, Wm. Creager Sur., 2 miles SE of Van Alystin.
Elev. 722 ft.; drlg. 3,434 ft.

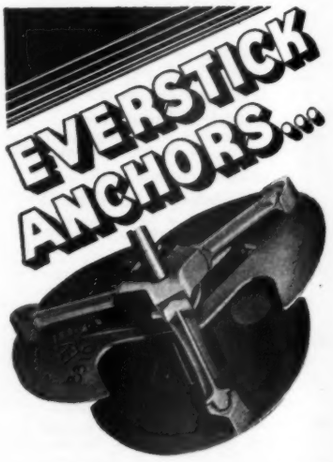
Port Bolivar O. & R. Co.'s No. 1 J. Shirley, 330 ft. N and W of 310-ac. tract, J. Sorrell Sur., 4 miles SE of Anna.
Elev. 684 ft.; S.D. 1,963 ft.

Ellis County

Beasley O. & G. Co.'s Inc.'s No. 1 E. Roller, 1,000 ft. from NW and 1,500 ft. from SW line of Sur.
S.D. 160 ft.

Fannin County

Warner Moore et al's No. 2 Hancock Est.,



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EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

1,200 ft. N and 500 ft. E of L. M. Baldock Sur., 1 mile E of Trenton.
Location.
Warner Moore et al's No. 1 Hancock, 400 ft. from W and 150 ft. N lines, Sec. 16, L. M. Baldock Sur., ½ mile S of Trenton.
Top sand 645 ft.; S.D. 657 ft.
R. Franklin Smith-Allen's No. 1 Argo, center of 16½-ac. tract in J. G. Swisher Sur.
S.D. 1,291 ft.

Freestone County

J. J. Leighton et al's No. 1 G. Cochran, 330 ft. from N and W of 100-ac. tract, D. Bullock Sur., 6 miles S of League.
Drlg. 1,075 ft.

Grayson County

Olson Drlg. Co.'s No. 1 Southwestern Life Ins. Co., center of 160-ac. tract and J. C. Jamison Sur., 6 miles NW of Denison.
Elev. 767 ft.; drlg. 2,505 ft.
Fort Bolivar O. & R. Co.'s No. 1 C. Taylor, 330 ft. S and W of 1,543-ac. tract, Fitzhugh Sur., 2¼ miles SE of Gunter.
Drlg. 2,412 ft.

Gregg County

C. L. Porter's No. 1 Mrs. F. G. Glover, 330 ft. N and 1,320 ft. from E line of Geo. Melton Sur. in SW cor. of county.
Derrick.

Henderson County

C. & G. Oil Co.'s No. 1 Sterrett, 350 ft. from S and 200 ft. from W of Isham Marshall Sur.
S.D. 1,200 ft.
Kirby Pet. Co.'s No. 1 C. L. Litchfield, 400 ft. N and 350 ft. W, I. Clendennen Sur.
S.D. 4,122 ft.; P.B. 4,064 ft.; to shoot cse.
H. M. Wilson's No. 1 fee, 970 varas S of NE cor. of 943-ac. tract, 5 miles N of Malakoff.
Derrick.

Hill County

Roger Lacey et al's No. 1 J. H. Atchison Est., 330 ft. S and E of E. Carroll Sur., 5 miles W of Hillsboro.
Derrick.

Hunt County

J. F. Morrissey & Co., Inc.'s No. 1 Fry, 543 ft. from N and 200 ft. from E of 146-ac. tract, 7 miles N of Commerce, C. Davis Sur.
T.D. 4,407 ft.

Kaufman County

Murry & Emerson's No. 1 G. W. Martin, 1,660 ft. from W and 20 ft. from N of 140-ac. tract, from W. L. C. Butler Sur., 2 miles NE of Kemp.
Top Austin 1,940-74 ft.; S.D. 2,240 ft.

Lamar County

Bruce Brothers' No. 1 Chas. Price, 2,640 ft. S and 3,960 ft. from E line of Wm. Nelson Sur., 10 miles NE of Paris, 1 mile W of Trout.
S.D. 336 ft.
L. W. Dennis' No. 1 W. C. Clark, 800 ft. from E and 1,800 ft. from N line of G. H. Hall Sur., 3 miles NE of Reno.
Derrick.
L. W. Dennis, trustee's No. 1 Mrs. E. Lawrence, 300 ft. from N and 1,160 ft. from W of T. B. Roundtree Sur., 2 miles NE of Blossom.
Derrick.
Texas-Gulf Pet. Co.'s No. 1 A. L. Darnell, 1,490 varas from S and 1,080 varas from W line of H. L. Williams Sur., 4 miles NE of Paris.
Drlg. 2,622 ft.
North Texas Synd., Eric T. Bradley, tr.'s No. 1 Wright, Alfred Moore Sur., 1,600 ft. S and 4,300 ft. from E line of Sur.
S.D. 2,579 ft.

Leon County

Tide Water Oil Co. et al's No. 1-A Carter, 500 ft. due E and 2,150 ft. N of SW cor. of lease in S. Sanchez Sur. No. 7.
S.D. 2,117 ft.

Limestone County

D. Crawford's No. 1 Mary Ward, 150 ft. out of NE cor. 28-ac. tract, P. Varella Sur.
Drlg. 2,929 ft.

McLennan County

T. Cunningham's No. 1 M. G. McKee, 940 ft. from S and 2,640 ft. W of 640-ac. tract, M. Snell Sur., near Bruceville.
Derrick.

Riley & Barrow's No. 1 Hortaman, V. C. Walters Sur., 500 ft. from most northerly N line, 500 ft. from most westerly E line, 500-ac. tract, 1¼ miles S McGregor.
S.D. 475 ft.

Nacogdoches County

Rosser Bros. & Jackson's No. 1 Mattby, 330 ft. out of NE cor. 60-ac. tract, Pedro J. Esparza Sur., 5 miles S of Nacogdoches.
S.D. 565 ft.

Navarro County

McCullough et al's No. 1 C. Berry, 330 ft from SE cor. of 35-ac. tract, 1 mile W of Dawson, William Moss Sur.
S.D. 1,500 ft.
E. M. Thomason's No. 1 T. P. Shivers, 1,500 ft. from W. and 600 ft. N. of 69-ac. tract, W. R. Bowen Sur., 2 miles S. of Corsicana.
S.D. 1,287 ft.

Rains County

Allen & McClung's No. 1 Giles, T. Cunningham Sur., Abst. 143, 330 ft. from W line and 200 ft. from N line of 105-ac. Giles tract, 5 mi. SW of Emory.
Derrick.
Allen & McClung's No. 1 Ida Bullard, N. Brantely Sur., 1,300 ft. from W line and 200 ft. from N line of 35-ac. tract, 2 mi. SW of Emory.
Derrick.
Allen & McClung & Collard's No. 1 S. P. Cain, 1,350 ft. N and 1,550 ft. W line of J. Harges Sur., 1 mile NW of Emory.
Location.

Red River County

Don F. Cleary's No. 1 C. S. Mowery, 150 ft. from S and 3,200 ft. W of most easterly E line of J. Bowerman Sur., 10 miles N of Clarksville.
Cored oil sand 1,130-50 ft., drlg. 1,155 ft.
Joe Dinger et al's No. 2 Morris, John Guest Sur., approx. 175 ft. NW of No. 1 Morris, 1 mile S Detroit.
Drlg. 676 ft.
R. H. Chew et al's No. 1 J. F. Brooks, 900 ft. N and 600 ft. of W line of 320-ac. tract, B. Gooch Sur., ½ mile S of Bagswell.
Derrick.
Joiner's No. 1 D. Rust, C. C. Wilborn Sur., 334 ft. N and 254 ft. W of most southerly SE cor. of Sur., just south of Avery.
Derrick.

Rockwall County

Dodd et al's No. 1 M. F. Lofland, 2,250 ft. from N and 3,250 ft. from E line of 392-ac. tract, W. H. Beird Sur., 2½ miles SE of Rockwall.
S.D. 192 ft.

Rusk County

Agey Drlg. Co.'s No. 1 John McWilliams Est., 330 ft. out of NW cor. of 240-ac. tract in J. C. De Lavina Sur.
Derrick.
J. W. Shipman et al's No. 1 Citizens Natl. Bank, NE cor. of 125-ac. tract, J. J. T'Barbo Sur., 4 miles NE of Henderson.
Elev. 432 ft.; drlg. 1,136 ft.

Titus County

S. Rotondi's No. 1 Lillianstun, 1,200 ft. E from NW cor. of J. Bodt Sur. and 330 ft. N, but in W. H. Crawford Sur., 5 miles NE of Talco.
Elev. 301 ft.; derrick.

Upshur County

E. S. Holman's No. 1 J. Daniels, 330 ft. from S and W of 47.5-acre tract, 5 miles W of field and 3 miles W of Prichett, Ira Stephenson Sur.
Drlg. 2,920 ft.

Van Zandt County

J. H. Gilliam et al's No. 1 E. S. Martin, 185 ft. most southerly SE line, and 208 ft. from most easterly SW line of tract, James Hamilton Sur., 3 miles NE of Wills Point.
Location.
Pioneer Exploration Co.'s No. 1 B. Spruce, 330 ft. out of SE cor. of 50-ac. tract, in J. Denman Sur., 8 miles S of Canton.
Top Austin 3,540 (broken) 3,590 (hard); S.D. 3,979 ft.

Wood County

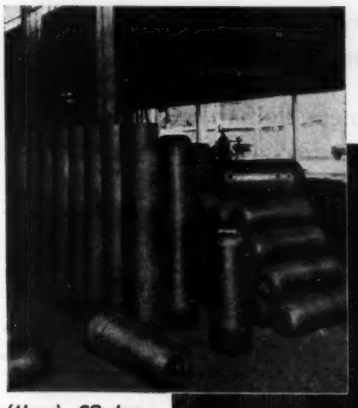
Westgate Oil Co.'s No. 1 West Lake Hunting and Fishing Club, 660 ft. from S and E of 428.6-ac. tract, M. Rentarariz Sur., 14 miles E of Mineola.
Material.

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

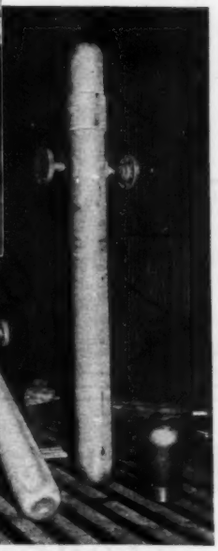
Company, well and location—	S.T.R.	Depth	Status
Shell Oil Co., No. 8 Capitan, Santa Barbara Co.	5- 4-30	3,242	cmtd. 3,068
Shell Oil Co., No. 9 Capitan, Santa Barbara Co.	5- 4-30	2,713	flow. 162 b.d.
General Petroleum, No. 15 Capitan, Santa Barbara Co..	32- 5-30	323	suspended
Shell Oil Co., No. 2 Goleta, Santa Barbara Co.	10- 4-29	3,085	sd. sh. drlg.
Honolulu Oil Corp., No. 9 Elwood, Santa Barbara Co...	tideland	4,276	rd. sd. drlg.
Barnsdall-Rio Grande, No. 12 Elwood, Santa Barbara..	tideland	6,703	redrlg. 3,800
Barnsdall-Rio Grande, No. 6 Elwood, Santa Barbara...	tideland	3,481	will dpn.
Barnsdall-Rio Grande, No. 2 Elwood, Santa Barbara...	15- 4-29	6,492	P.B. 3,836
Bankline Oil Co., No. 10 Elwood, Santa Barbara Co...	tideland	3,835	redrlg. 3,143
Pacific Western, No. 16 Elwood, Santa Barbara Co. ..	tideland	2,292	sd. sh. drlg.
Spalding, Caroline, No. 13 Elwood, Santa Barbara Co..	tideland	3,481	will dyn.
Field, O. C., No. 1 Santa Maria, Santa Barbara Co. ..	28-10-33	1,198	sd. sh. drlg.
Freeman, M. J., No. 1 Purisima, Santa Barbara Co. ..	11- 7-33	1,462	will test
Mar Monte Oil Co., No. 1 Summerland, Santa Barbara	16- 4-26	542	sd. sh. drlg.
Santa Barbara Oil, No. 1 Carpinteria, Santa Barbara.	29- 4-25	197	sd. sh. drlg.
Dietzman, Julius, No. 1 Carpinteria, Santa Barbara Co.	8- 4-25	....	rigged up
Las Posas Pet., No. 1 Las Posas, Ventura Co.	22- 3-20	8,116	P.B. 6,400
Union Oil Co., No. 1 Bardsdale, Ventura Co.	12- 3-20	5,051	sd. sh. drlg.
Monticello Oil Co., No. 1 Bardsdale, Ventura Co.	12- 3-20	4,011	D.P. stuck
Duke Oil Co., No. 1 Bardsdale, Ventura Co.	7- 3-19	....	bldg. rig
The Texas Co., No. 1 Fillmore, Ventura Co.	29- 4-19	5,175	cleaning out

An INVITATION
to A.P.I. Convention Visitors

While in Los Angeles, make it a point to visit the Midwest plant at 520 Anderson St. Anyone concerned with oil industry piping will find it interesting and well worth while. Shown here are only a few of the great variety of fabrications produced in this modern piping plant.



(Below)— Drip pots for 1600-lb. gas working pressure. Made from 9" Ex. hy. seamless with end closures by spinning.



(Above)—CO_2 drums for 950-lb. working pressure, after end spinning operation and before welding.

(Below)— Bend contains 92' 4½" of 18" O.D. steel tubing and has "Globack" joints.

MIDWEST PIPING & SUPPLY COMPANY, INC.

Los Angeles Plant · 520 Anderson St.

Plants also at St. Louis, Missouri, and Passaic, New Jersey

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OIL AND REFINING COMPANY

HOUSTON, TEXAS

Service Goes With Everything We Sell

Laying & Jacobs, No. 1 Shiells Canyon, Ventura Co...	32- 4-19	1,876	sd. sh. drlg.
El Rancho Oil Co., No. 1 South Mountain, Ventura Co..	9- 3-19	1,110	cleaning out
Bankline Oil Co., No. 1 South Mountain, Ventura Co...	3- 3-19	3,634	will cmt.
Hull, James, No. 1 Susana, Ventura Co.	2- 2-18	1.150	suspended
Ventura Expl. Co., No. 1 Saticoy, Ventura Co.	30- 3-22	7,068	cmtd.
Prop. Service Corp., No. 1 Lloyd, Ventura Co.	24- 3-23	9,582	P.B. 9,572
General Pet., No. 1 Oxnard, Ventura Co.	26- 2-23	7,625	will redrl.
Honolulu Oil Corp., No. 2 Rincon, Ventura Co.	tideland	664	sd. sh. drlg.
Continental Oil Co., No. 5 San Miguelito, Ventura Co...	15- 3-24	....	bldg. rig
C. C. M. Oil Co., No. 1 San Miguelito, Ventura Co.	23- 3-24	7,906	P.B. 7,562
Standard Oil Co., No. 1 Lost Hills, Kern Co.	2-26-20	5,824	recmtd. 5,766
Cumberland Oil Co., No. 1 Devil's Den, Kern Co.	17-26-18	3,313	cleaning out
Belmac Drlg. Co., No. 1 McKittrick, Kern Co.	22-29-21	4,100	hd. sd. drlg.
Belmac Drlg. Co., No. 2 McKittrick, Kern Co.	21-29-21	352	sd. sh. drlg.
Big McKittrick Oil Co., No. 1 McKittrick, Kern Co...	30-30-22	622	suspended
Bering, R. E., No. 1 McDonald, Kern Co.	12-28-19	397	sd. sh. drlg.
General Pet. Co., No. 1 South Belridge, Kern Co.	30-28-21	11,377	suspended
Standard Oil Co., No. 2 North Belridge, Kern Co.	36-27-20	8,200	flow. 6,660 b.d.
Standard Oil Co., No. 3 North Belridge, Kern Co.	36-27-20	7,452	br. sh. drlg.
Belridge Oil Co., No. 32-35 North Belridge, Kern Co...	35-27-20	8,487	flow 4,425 b.d.
Belridge Oil Co., No. 33-35 North Belridge, Kern Co...	35-27-20	7,961	sd. sh. drlg.
Belridge Oil Co., No. 48-35 North Belridge, Kern Co...	35-27-20	3,780	sd. sh. drlg.
Continental Oil Co., No. 6 North Belridge, Kern Co. ..	36-27-20	7,361	hd. sh. drlg.
Union Oil Co., No. 19 North Belridge, Kern Co.	36-27-20	7,998	cleaning out
Union Oil Co., No. 20 North Belridge, Kern Co.	36-27-20	8,274	br. sh. drlg.
Ohio Oil Co., No. 1 Maricopa Flats, Kern Co.	11-11-22	5,884	sd. sh. drlg.
Woods & Bailey, No. 1 McFarland, Kern Co.	16-26-26	2,490	suspended
Standard Oil Co., No. 1 Delano, Kern Co.	1-25-23	2,455	gas; shut in
Standard Oil Co., No. 2 Delano, Kern Co.	1-25-23	3,256	gas; shut in
Standard Oil Co., No. 4 Delano, Kern Co.	34-24-23	2,460	gas; shut in
Standard Oil Co., No. 5 Delano, Tulare Co.	33-24-23	2,466	cmtd. 2,420
Trico Oil & Gas Co., No. 1 Delano, Kern Co.	3-25-23	2,525	gas; shut in
Trico Oil & Gas Co., No. 3 Delano, Kern Co.	36-24-22	4,835	suspended
Trico Oil & Gas Co., No. 5 Delano, Kern Co.	3-25-23	2,467	gas; shut in
Richardson & Heaston, No. 1 Kern Front, Kern Co. ..	5-28-28	2,474	sd. sh. drlg.
McDonald & Deavin, No. 1 Kern Front, Kern Co.	10-28-27	231	suspended
National Oil Co., No. 2 Kern Front, Kern Co.	11-28-27	1,531	sd. sh. drlg.
Associated Oil Co., No. 5 Kern Front, Kern Co.	4-28-27	2,847	pump 365 b.d.
Associated Oil Co., No. 6 Kern Front, Kern Co.	4-28-27	....	rigged up
Oil Factors, Inc., No. 1 Kern Front, Kern Co.	6-28-27	....	rig; suspended
C. C. M. Oil Co., No. 8 Kern Front, Kern Co.	23-28-27	2,090	cmtd. 1,810
C. C. M. Oil Co., No. 9 Kern Front, Kern Co.	23-28-27	....	rig; suspended
C. C. M. Oil Co., No. 10 Kern Front, Kern Co.	23-28-27	....	bldg. rig
Kreigha, C. H., No. 1 Kern Front, Kern Co.	4-28-27	250	sd. drlg.
Republic Petroleum, No. 6 Kern Front, Kern Co.	24-28-27	....	location
Standard Oil Co., No. 4 Kern Front, Kern Co.	5-28-27	2,625	pump 230 b.d.
Standard Oil Co., No. 5 Kern Front, Kern Co.	5-27-28	2,821	O.S. cmt. 2,820
Standard Oil Co., No. 6 Kern Front, Kern Co.	5-28-27	....	rig; suspended
Standard Oil Co., No. 7 Kern Front, Kern Co.	5-28-27	....	location
The Texas Co., No. 1 Kern Front, Kern Co.	23-28-27	....	bldg. rig
Barnsdall Oil Co., No. 5 Mountain View, Kern Co.	32-30-29	1,592	sd. sh. drlg.
Barnsdall Oil Co., No. 6 Mountain View, Kern Co.	30-30-29	1,933	sd. sh. drlg.
Gilmore-Snyder, No. 2 Mountain View, Kern Co.	24-30-28	5,400	O.S. drlg.
Canal Oil Co., No. 1 Mountain View, Kern Co.	30-30-29	5,705	completing
Union Oil Co., No. 10 Mountain View, Kern Co.	23-30-28	2,371	sd. sh. drlg.
Hancock Oil Co., No. 8 Mountain View, Kern Co.	14-30-28	5,096	redrlg. 2,281
Hancock Oil Co., No. 9 Mountain View, Kern Co.	14-30-28	....	rig; suspended
Hogan Pet. Co., No. 6 Mountain View, Kern Co.	29-30-29	5,889	flow. 1,230 b.d.
Hogan Pet. Co., No. 7 Mountain View, Kern Co.	4-31-29	5,361	sd. sh. drlg.
Hogan Pet. Co., No. 8 Mountain View, Kern Co.	32-30-29	....	rigging up
Vesta Pet. Co., No. 2 Mountain View, Kern Co.	19-30-29	....	bldg. rig
Wood-Callahan Oil Co., No. 1 Mountain View, Kern Co.	30-30-29	5,680	will dpn.
O'Kane & Brain, No. 2 Mountain View, Kern Co.	30-30-29	....	bldg. rig
Mohawk Oil Co., No. 14 Mountain View, Kern Co.	30-30-29	5,552	sd. sh. drlg.
Mohawk Oil Co., No. 15 Mountain View, Kern Co.	30-30-29	4,630	sd. sh. drlg.
Mohawk Oil Co., No. 16 Mountain View, Kern Co.	30-30-29	....	rigging up
Ohio Oil Co., No. 1 Mountain View, Kern Co.	33-30-29	5,999	redrlg. 4,261
Shell Oil Co., No. 5 Mountain View, Kern Co.	32-30-29	5,240	sd. sh. drlg.
Standard Oil Co., No. 13 Mountain View, Kern Co.	23-30-28	5,565	fish. swab.
Standard Oil Co., No. 14 Mountain View, Kern Co.	24-30-28	5,197	O.S. drlg.
Standard Oil Co., No. 15 Mountain View, Kern Co.	13-30-28	3,462	sd. sh. drlg.
Standard Oil Co., No. 16 Mountain View, Kern Co.	13-30-28	....	rig; suspended
Standard Oil Co., No. 17 Mountain View, Kern Co.	24-30-28	3,691	sd. sh. drlg.
Standard Oil Co., No. 18 Mountain View, Kern Co.	24-30-28	2,480	sd. sh. drlg.
Treasure Oil Co., No. 1 Mountain View, Kern Co.	12-30-28	....	bldg. rig
Mountain View Oil Co., No. 1 Mountain View, Kern Co.	25-30-28	5,650	cleaning out
Jergins Trust, No. 5 Mountain View, Kern Co.	24-30-28	5,761	milling
Jergins Trust, No. 6 Mountain View, Kern Co.	30-30-29	3,951	sd. sh. drlg.
United Expl. Co., No. 1 Bakersfield, Kern Co.	23-30-27	3,754	suspended
Standard Oil Co., No. 1 Round Mountain, Kern Co. ..	3-29-29	1,931	sd. sh. drlg.
Jergins Trust, No. 11 Edison, Kern Co.	13-30-29	1,386	pump 744 b.d.
Jergins Trust, No. 12 Edison, Kern Co.	13-30-29	....	rigging up
Jergins Trust, No. 13 Edison, Kern Co.	13-30-29	1,164	sd. sh. drlg.
Shell Oil Co., No. 9 Edison, Kern Co.	14-30-29	....	bldg. rig
Shell Oil Co., No. 10 Edison, Kern Co.	15-30-29	....	bldg. rig
Rogers & Osborne, No. 1 Edison, Kern Co.	19-30-30	1,031	sd. sh. drlg.
General Pet., No. 10 Edison, Kern Co.	24-30-29	....	rig; suspended
General Pet., No. 11 Edison, Kern Co.	10-30-29	1,961	sd. sh. drlg.
Appling, C. E., No. 1 Edison, Kern Co.	4-30-29	3,690	P.B. 3,625
Bauer, J. H., No. 1 Edison, Kern Co.	21-30-29	4,554	P.B. 3,195
Seeple, J. O., No. 1 Elk Hills, Kern Co.	5-30-24	5,265	suspended
General Pet., No. 1 Arvin, Kern Co.	1-32-29	8,862	hd. sd. drlg.
Hall-Baker Co., No. 1 Arvin, Kern Co.	16-31-30	1,276	suspended
Hall-Baker Co., No. 4 Arvin, Kern Co.	20-31-30	1,893	granite; abd.
Hutcheson & Osborne, No. 2 Arvin, Kern Co.	32-30-30	700	cmtd. 665
Arlington Prop., No. 1 Buttonwillow, Kern Co.	6-28-23	3,235	gas; shut in
Milham Expl. Co., No. 5 Buttonwillow, Kern Co.	5-28-23	3,127	gas; shut in
The Texas Co., No. 1 Buttonwillow, Kern Co.	6-28-23	2,435	gas; shut in
The Texas Co., No. 2 Buttonwillow, Kern Co.	8-28-23	2,475	gas; shut in
Superior Oil Co., No. 1 Semi-Tropic, Kern Co.	23-27-23	2,418	gas; shut in
Superior Oil Co., No. 2 Semi-Tropic, Kern Co.	34-27-24	5,400	sd. sh. drlg.
Fullerton Oil Co., No. 1 Semi-Tropic, Kern Co.	1-27-22	2,391	gas; shut in
Fullerton Oil Co., No. 2 Semi-Tropic, Kern Co.	14-27-23	2,463	gas; shut in
Fullerton Oil Co., No. 3 Semi-Tropic, Kern Co.	9-27-23	3,150	gas; shut in
Fullerton Oil Co., No. 4 Semi-Tropic, Kern Co.	26-27-23	2,395	gas; shut in
Fullerton Oil Co., No. 5 Semi-Tropic, Kern Co.	8-27-23	2,347	gas; shut in
Fullerton Oil Co., No. 6 Semi-Tropic, Kern Co.	25-27-23	2,441	gas; shut in
Fullerton Oil Co., No. 7 Semi-Tropic, Kern Co.	25-27-23	2,437	gas; shut in
Fullerton Oil Co., No. 8 Semi-Tropic, Kern Co.	25-27-23	2,439	1,900 m.f. gas
Fullerton Oil Co., No. 9 Semi-Tropic, Kern Co.	26-27-23	2,431	gas; shut in
Fullerton Oil Co., No. 10 Semi-Tropic, Kern Co.	15-27-23	2,414	gas; shut in
Fullerton Oil Co., No. 13 Semi-Tropic, Kern Co.	31-27-23	....	rigging up
Standard Oil Co., No. 1 Semi-Tropic, Kern Co.	8-27-23	3,200	gas; shut in
Standard Oil Co., No. 3 Semi-Tropic, Kern Co.	7-27-23	2,355	gas; shut in
Standard Oil Co., No. 4 Semi-Tropic, Kern Co.	9-27-23	4,587	hd. sh. drlg.
Standard Oil Co., No. 6 Semi-Tropic, Kern Co.	8-27-23	2,361	gas; shut in
Standard Oil Co., No. 7 Semi-Tropic, Kern Co.	1-27-22	3,876	redrlg. 3,440
Standard Oil Co., No. 8 Semi-Tropic, Kern Co.	12-27-22	2,426	gas; shut in
Standard Oil Co., No. 9 Semi-Tropic, Kern Co.	1-27-23	....	foundation
Standard Oil Co., No. 11 Semi-Tropic, Kern Co.	20-27-24	4,475	deep test
Standard Oil Co., No. 12 Semi-Tropic, Kern Co.	30-27-24	4,200	br. sh. drlg.
Standard Oil Co., No. 13 Semi-Tropic, Kern Co.	6-27-23	2,408	gas; shut in
Standard Oil Co., No. 14 Semi-Tropic, Kern Co.	36-27-23	....	rig; suspended
Standard Oil Co., No. 15 Semi-Tropic, Kern Co.	16-27-23	3,215	cmtd. 3,140
Standard Oil Co., No. 17 Semi-Tropic, Kern Co.	16-27-23	3,051	cmtd. 3,000
Milham Expl. Co., No. 1 Semi-Tropic, Kern Co.	15-27-23	3,122	gas; shut in
Milham Expl. Co., No. 2 Semi-Tropic, Kern Co.	15-27-23	2,429	gas; shut in
Milham Expl. Co., No. 3 Semi-Tropic, Kern Co.	15-27-23	2,385	gas; shut in
Milham Expl. Co., No. 4 Semi-Tropic, Kern Co.	24-27-23	2,486	gas; shut in
Comanche Oil Co., No. 1 Comanche, Kern Co.	15-32-29	4,952	sd. sh. drlg.
Tejon Ridge Oil Co., No. 1 Comanche, Kern Co.	23-32-29	2,187	cleaning out
Shell Oil Co., No. 1 Buena Vista, Kern Co.	9-32-25	9,443	sd. sh. drlg.
Ohio Oil Co., No. 3 Buena Vista, Kern Co.	31-31-26	4,597	sd. sh. drlg.
Silver Gate Oil & Gas Co., No. 1 Tejon, Kern Co. ..	7-10-19	2,900	gr. sd. drlg.
Pacific Expl. Co., No. 1 Kreyenhagen, Fresno Co. ..	17-21-17	1,410	suspended
Union Oil Co., No. 1 Lillis-Kettleman, Fresno Co.	24-21-16	10,944	redrlg. 10,165
K.N.D.A., No. 54 Kettleman North, Fresno Co.	24-21-16	6,358	cleaning out
Standard Oil Co., No. 2 Kettleman Middle, Kings Co...	29-23-19	7,885	fishing

Pet. Sec., No. 1 Kettleman Middle, Kings Co.	30-23-19	6,371	br. sh. drlg.
Farrell Pet., Well No. 1, San Luis Obispo Co.	18-31-12	1,908	sd. sh. drlg.
Birch-Royer Oil Co., No. 1 Pismo, San Luis Obispo Co.	33-31-13	100	sd. sh. drlg.
United Oil Co., Well No. 1, San Luis Obispo Co.	2-32-21	....	bldg. rig
Willett Oil Co., No. 1 Cholame, San Luis Obispo Co.	10-25-15	3,687	will recmt.
Millham Expl. Co., No. 1 Tulare Lake, Kings Co.	5-22-19	1,061	sd. sh. drlg.
Commonwealth Consd. Gas., No. 1 Tulare Lake, Kings	21-22-20	2,490	gas; shut in
Commonwealth Consd. Gas., No. 2 Tulare Lake, Kings	21-22-20	1,385	sd. sh. drlg.
Dudley Ridge Dev. Co., No. 1 Dudley Ridge, Kings Co.	24-23-20	1,300	suspended
Amerada Pet., No. 1 F.L.D., San Joaquin Co.	15- 2-5	8,700	hd. sh. drlg.
Amerada Pet., No. 2 F.L.D., San Joaquin Co.	15- 2-5	4,063	producing gas
Amerada Pet., No. 3 F.L.D., San Joaquin Co.	22- 2-5	4,060	33,800 m.f. gas
Pure Oil Co., No. 1 Chowchilla, Madera Co.	7-10-14	8,402	gas; shut in
Pure Oil Co., No. 2 Chowchilla, Madera Co.	8-10-14	3,191	sd. sh. drlg.
Northern Counties Pet., No. 1 Tehama, Tehama Co.	25-24-3	5,031	recmtd. 4,904
Shell Oil Co., No. 1 Branch, Monterey Co.	34-24-10	5,897	sd. sh. drlg.
Clark, George, No. 1 Ducor, Tulare Co.	31-23-28	1,364	sd. sh. drlg.
Seahawk Oil Co., No. 1 White River, Tulare Co.	24-24-28	....	material
Buttes Oilfields, Well No. 3, Sutter Co.	11-15-1	5,213	recmtd. 4,944

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S.T.R.	Depth	Status
Larco Oil Co., No. 1 El Segundo, Los Angeles Co.	12- 3-15	7,600	redrlg. 5,500
Sovereign Oil Co., No. 1 El Segundo, Los Angeles Co.	22- 3-14	6,235	sd. sh. drlg.
Pioneer Holding Co., No. 1 El Segundo, Los Angeles Co.	33- 3-14	2,472	sd. sh. drlg.
Clark, T. R., No. 1 El Segundo, Los Angeles Co.	6- 4-14	....	bldg. rig
Shell Oil Co., No. 1 Long Beach, Los Angeles Co.	13- 4-13	....	bldg. rig
Standard Oil Co., No. 10 Inglewood Deep, Los Angeles	8- 2-14	3,320	O.S. drlg.
Standard Oil Co., No. 11 Inglewood Deep, Los Angeles	8- 2-14	3,120	cmtd. 2,700
Blackline Oil Co., No. 1 Del Rey, Los Angeles Co.	27- 2-15	6,634	redrlg. 6,400
Crest Oil Co., No. 1 Del Rey, Los Angeles Co.	27- 2-15	6,702	cleaning out
Mathews Pet. Co., No. 1 Del Rey, Los Angeles Co.	27- 2-15	6,543	suspended
Birch Royer Oil Co., No. 1 Del Rey, Los Angeles Co.	34- 2-15	6,537	cmtd. 6,300
Joyce Oil Co., No. 1 Del Rey, Los Angeles Co.	27- 2-15	6,742	P.B. 6,675
Anglo American Oil Co., No. 1 Del Rey, Los Angeles	27- 2-15	6,825	hd. sh. drlg.
Union Oil Co., No. 17 Del Rey, Los Angeles Co.	27- 2-15	6,071	flow. 798 b.d.
Treasure Oil Co., No. 1 Del Rey, Los Angeles Co.	27- 2-15	5,157	redrlg. 4,952
Yant Pet. Corp., No. 1 Newhall, Los Angeles Co.	1- 3-16	....	rigged up
Dabney Pet. Co., No. 1 Malibu, Los Angeles Co.	5- 2-18	65	tech. spud
Vanco Dev. Co., No. 1 Artesia, Los Angeles Co.	25- 3-12	5,817	suspended
Eyer Pet. Co., No. 1 Torrance, Los Angeles Co.	20- 4-13	1,410	sd. sh. drlg.
Monarch Oil Corp., No. 1 Topanga, Los Angeles Co.	5- 1-16	652	hd. sd. drlg.
Standard Oil Co., No. 78 Montebello, Los Angeles Co.	2- 2-12	3,835	cmtd. 3,605
Signal Oil Co., No. 1 Montebello, Los Angeles Co.	4- 2-11	1,581	sd. sh. drlg.
Woodward Oil Co., No. 2 Montebello, Los Angeles Co.	4- 2-11	....	rig; suspended
The Texas Co., No. 1 Montebello, Los Angeles Co.	5- 2-11	7,275	fish. D.P.
The Texas Co., No. 2 Montebello, Los Angeles Co.	5- 2-11	5,781	form. test
Universal Consd., No. 3 Montebello, Los Angeles Co.	5- 2-11	6,553	sd. sh. drlg.
Universal Consd., No. 4 Montebello, Los Angeles Co.	5- 2-11	5,608	recmtd. 5,550
St. Helens Pet. Co., No. 2 Montebello, Los Angeles Co.	5- 2-11	....	location
Wilshire Oil Co., No. 1 Montebello, Los Angeles Co.	5- 2-11	5,971	cleaning out
Wilshire Oil Co., No. 2 Montebello, Los Angeles Co.	4- 2-11	3,761	hd. sd. drlg.
Wilshire Oil Co., No. 3 Montebello, Los Angeles Co.	11- 2-11	3,082	sd. sh. drlg.
North American, No. 1 Montebello, Los Angeles Co.	30- 1-10	4,000	sd. sh. drlg.
Hillman & Long, No. 1 Montebello, Los Angeles Co.	28- 1-11	2,987	sd. sh. drlg.
Frontier Oil Co., No. 1 Pico, Los Angeles Co.	7- 2-11	5,246	suspended
Oil & Gas Associates, No. 1 Pico, Los Angeles Co.	9- 2-11	2,750	hd. sh. drlg.
Pressel & Tull, No. 1 Puente, Los Angeles Co.	30- 2-9	4,535	cleaning out
Fraser, N. M., No. 1 Saugus, Los Angeles Co.	31- 4-16	853	suspended
International Oil Dev., No. 1 Saugus, Los Angeles Co.	34- 5-16	931	sd. sh. drlg.
Great Coastal Oil Co., No. 1 Elsinore, Riverside Co.	36- 5-5	1,550	sd. sh. drlg.
Domain Dev. Co., No. 1 Trabuco, Orange Co.	3- 6-7	1,086	suspended
Continental Oil Co., No. 1 Santa Ana, Orange Co.	14- 5-10	3,998	sd. sh. drlg.
Leaseholders Dev. Co., No. 1 Atwood, Orange Co.	26- 3-9	4,040	rig blew down
Cook, T. A., No. 1 Richfield, Orange Co.	36- 3-9	....	rig blew down
Standard Oil Co., No. 1 Richfield, Orange Co.	36- 3-9	1,862	sd. sh. drlg.
Viking Oil Co., No. 1 Richfield, Orange Co.	29- 3-9	4,783	cleaning out
Hillman & Long, No. 1 San Juan, San Bernardino Co.	2- 3-8	2,418	suspended
Tehama Pet. Co., No. 1 Chino, San Bernardino Co.	33- 2-8	3,068	cleaning out

LA.-ARK. WILDCATS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

Bossier Parish

Ark.-La. Gas Co.'s No. 1-B Werner, 1,258 ft. N, 624 ft. E, SW cor. SE SE Sec. 7-17-11.
Rigging up.

Bossier O. & G. Co.'s No. 3 Sherrill, 330 ft. N and W, SE cor. Sec. 13-19-12.
S.D. 2,180 ft.

V. M. Miller's No. 1 Curtis Plant, Sec. 19-17-12.
S.D. 835 ft.

Premier Investment Co.'s No. 2 Larkin, 660 ft. N and 150 ft. E SW cor. Sec. 14-19-11.
Rigging up.

Producers O. & G. Co.'s No. 1 Pettitt, 330 ft. S and W, NE cor. NW Sec. 17-17-11.
Coring 3,199 ft.

Producers O. & G. Co.'s No. 1 Edwards 460 ft. N and W, SE cor. Sec. 27-18-11.
S.D. for fuel 860 ft.

Triangle Drlg. Co.'s No. 3 Skannal, Unit 50, S and W of C of NE.
Set 20-in. 100 ft.

Caddo Parish

J. Ed Bailey, tr.'s No. 1 Hartzo, NW cor. NE NW Sec. 28-22-16.
S.D. 1,236 ft.

John D. Bialock's No. 2-A Seybert, 270 ft. N and 320 ft. E of C Sec. 17-20-15.
S.D. 1,500 ft.

J. M. Collins' No. 1 fee, 2,042 ft. N, 394 ft. E, SW cor. Sec. 4-20-15.
Testing oil and gas show 2,196 ft.

The Hunter Co.'s No. 1 fee, 330 ft. N and E SW cor. SW SE Sec. 17-19-14.
Drlg. 50 ft.

F. D. Hyde's No. 1 Thigpen & Herold, 350 ft. S and E, C Sec. 5-15-15.
S.D. 1,760 ft.

A. D. King, tr.'s No. 1 Roach, 641 ft. E, 375 ft. N, SW cor. SE Sec. 4-14-16.
T.A. 2,712 ft.

Max Brandt's No. 1 Hughes, SW cor. NE NW Sec. 15-20-15.
Tested 500,000 ft. gas; S.D.; W.O. 3,206 ft.

Poindexter & Tucker's No. 4 Levy, SW cor. SE NE Sec. 16-20-15.
Rigging up.

Puritan Oil Co.'s No. 1 Land, 550 ft. E, 250 ft. N, SW cor. Sec. 4-20-15.
W.O.S.R. 2,151 ft.

Shreveport Oil Corp.'s No. 7-B Muslow, 495 ft. N, 1,320 ft. E, SW cor. Sec. 4-20-15.
Set 10-in. 80 ft., drlg. 1,002 ft.

Shreveport Oil Corp.'s No. 2-G Muslow, 780 ft. S, 578 ft. W, NE cor. NW Sec. 9-20-15.
W.O.S.R. 2,185 ft.

The Leonard Co.'s No. 3-G Muslow, 660 ft. N, 500 W, SE cor. NW Sec. 17-20-15.
Comp., 500,000 ft. gas 821 ft.

Ty-Stan, Inc.'s No. 1 Jolly, 400 ft. S and E, NW cor. SW SW Sec. 22-22-15.
Coring 2,803 ft.

Caldwell Parish

Caldwell Drlg. Co.'s No. 2 Gore, 280 ft. S, 600 ft. W, NE cor. SE Sec. 30-12-3e.
S.D.; W.O. 768 ft.

Critchett & Wooda' No. 1 Kyles, NE cor. SW NE Sec. 18-11-3e.
Whipstocking 1,690 ft.; old T.D. 1,740 ft.

G. W. Zeigan et al's No. 1 La.-Central Lbr. Co., 175 ft. S and E, NW cor. SW SW Sec. 25-13-3e.
S.D. 1,200 ft.

Catahoula Parish

McIntyre et al's No. 1 Tensas, 1,740 ft. S, 990 ft. E, NW cor. Sec. 18-10-4e.
Drlg. 2,810 ft.

Claiborne Parish

J. H. Lester's No. 1 Green, 330 ft. S and W of NE cor. NE NW Sec. 18-21-6.
Dry and abandoned 3,384 ft.

E. T. Oakes' No. 1 H. W. Patton Est., 660 ft. S and W, NE cor. Sec. 1-20-5w.
Drlg. 3,934 ft.

Ryan Oil Corp.'s No. 1 F. A. Gladney, 660 ft. S, 330 ft. E, NW cor. SE Sec. 10-23-16.
Coring 2,894 ft.

United Gas Public Service Co.'s No. 2 Durrett, 660 ft. N and 1,980 ft. E, SW cor. Sec. 31-20-5.
Derrick.

De Soto Parish

E. B. Bird et al's No. 1 J. H. Johns, 330 ft. N and W, C Sec. 20-14-4.
Tested S.W. 2,622 ft., S.D.W.O.

Century Drlg. Co.'s No. 1 D. Bailey, 440 ft. S and W C Sec. 25-11-14.
Drlg. 2,730 ft.

Sam Goldman's No. 1 G. R. Stell, 330 ft. S and W, NE cor. Sec. 5-12-16.
S.D. 200 ft.

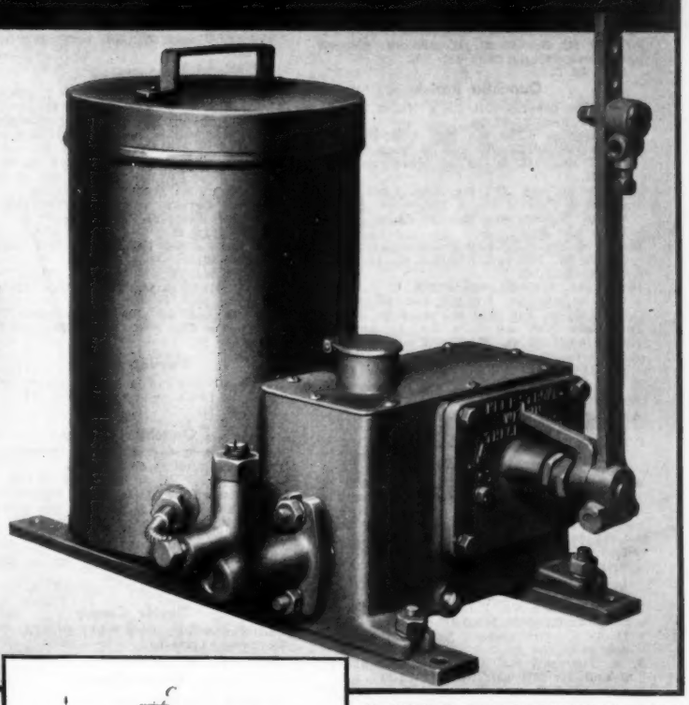
Jai Drlg. Co.'s No. 1-A Scales, 330 ft. N and E, SW cor. SE SE Sec. 35-13-12.
Drlg. 2,397 ft.

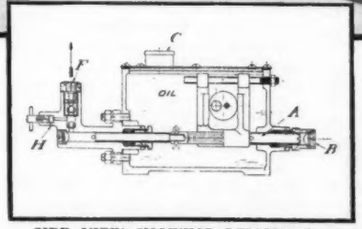
Leslie Prod. Co.'s No. 1 Ramsey, 150 ft N and W of C Sec. 36-11-11.
Set 10-in. 45 ft.

C. T. Ruffin's No. 2 Lee, 150 ft. N, 660 ft. E, SW cor. NW SW Sec. 33-14-13.
Blowing to test 2,843 ft.

Ed Saffold et al's No. 1 Thigpen, Sec. 33-13-13.
O.W.D.D.; S.D. 1,940 ft.

...McCORD CHEMICAL MEASURING PUMP





SIDE VIEW SHOWING REMOVABLE PUMP UNIT AND ADJUSTMENT

McCORD CLASS "C" RATCHET DRIVE

A MEASURING PUMP FOR THE INJECTION OF CHEMICALS INTO CRUDE OIL LINES

When used for the delivery or injection of chemicals into crude oil lines an auxiliary chemical tank, made of terneplate, of three-gallon capacity is provided. This tank is connected to the suction side of the pump. For this service pump units, made of steel, are used. (Pump units made of other alloys can be supplied.)

The standard pump is furnished with a ½-inch plunger, ⅜-inch or ⅝-inch can be furnished, giving a wide range of delivery according to the driving speed. Adjustments are made from outside. A test screw is provided to check delivery of the liquid upon starting the pump. Another McCord feature is a double ball check valve at the end of the line, which holds the liquid in the line and insures immediate delivery of the liquid. Four standard types of drive are provided: ratchet reciprocating, rotary 37½ to 1, or a motor drive unit with a 68 to 1 reduction, or a direct rotary drive 1 to 1. A 5-inch or 7-inch pulley can be supplied on rotary drives.

CAPACITY

The ½-inch plunger model delivers one pint of liquid in 261 plunger movements. The ⅜-inch plunger model delivers one pint of liquid in 464 plunger movements, while the ⅝-inch plunger model delivers one pint in 167 plunger movements.

DISTRIBUTED BY
NATIONAL SUPPLY CO.
ALL BRANCHES
TUNNELL, WOOD AND NEILAN, Inc., Los Angeles, Calif.

LUBRICATOR DIVISION
McCORD RADIATOR & MFG. CO.
DETROIT • MICHIGAN

Union Pet. Co.'s No. 1 Hill, Sec. 3-10-13. Drlg. 1,876 ft.

Grant Parish

Alexander et al's No. 1 Maxwell, Sec. 9-9-1e. Drlg. 1,102 ft.

Lincoln Parish

Herman L. Brown's No. 1 Monstead, 1,320 ft. S, 660 ft. E of C Sec. 10-17-4w. Set 7-in. 5,270 ft.; T.D. 5,301 ft.

Madison Parish

Southern Land & Exploration Co.'s No. 1 Delta Land Co., Sec. 1-17-12e. Arrng. to set 8¼-in. csg. 2,100 ft.; T.D. 2,207 ft.

Morehouse Parish

United Gas Public Service Co.'s No. 31 Crossett, 1,320 ft. S, 660 ft. E, SW cor. Sec. 15-21-4e. Rigging up.

United Gas Public Service Co.'s No. 16 Tensas, 1,320 ft. N, 660 ft. E, SW cor. Sec. 10-21-4e. Set 10-in. 161 ft., drlg. 1,844 ft.

Zeiger & Bacon's No. 2 Crossett Lbr. Co., 1,370 ft. N, 595 ft. E, SE cor. SE SW of Sec. 34, in Sec. 41. S.D. 50 ft.

Ouachita Parish

American Liberty Oil Co.'s No. 1 Golson, C NW Sec. 25-17-1e. Set 5½-in. 5,200 ft.; T.D. 5,281 ft.

Carbon Consolidated's No. 6 Feazel, 2,310 ft. N and 760 ft. W of center Sec. 25-19-3E. Set 10-in. csg. 197 ft., drlg. 1,800 ft.

Inabnet & Piper's No. 2 D'Arbone, 660 ft. S and W, NE cor. Sec. 28-19-3e. Drlg. 500 ft.

Inabet & Piper's No. 2 Douglas, 376 ft. S, 597 ft. W, NE cor. NW Sec. 31-19-4e. Set 6-in. 2,145 ft.

Interstate Nat. Gas Co.'s No. 42 fee, 350 ft. S of NW cor. NE NE Sec. 24-19-3e. Set 12½-in. csg. 170 ft., set 8-in. 756 ft.

Interstate Nat. as Co.'s No. 40 fee, 475 ft. S and 396 ft. E of NW cor. SE Sec. 30-19-4e. Set 12½-in. csg. 172 ft.; set 8-in. 759 ft.

Rapides Parish

Amerada Pet. Co.'s No. 1 Weil, 2,460 ft. N, 550 ft. E, SW cor. Sec. 53-1s-2e. Drlg. 6,468 ft.

Natchitoches Parish

Ab Jones' No. 1 Brown Lbr. Co., 400 ft. N, 330 ft. W, SE cor. Sec. 5-10-10. S.D. 1,023 ft.

Union Petroleum Co.'s No. 1 DeBlieux, 1,395 ft. E, 150 ft. S, NW cor. Sec. 33-10-7. Drlg. 1,700 ft.

Red River Parish

India Oil Co.'s No. 1 La. Pecan Co., 2,590 ft. W and 850 ft. N of SE cor. Sec. 27-13-11. Set 10-in. 81 ft.

J. S. Tuffree's No. 1 Wilkinson, 1,320 ft. S and W, NE cor. Sec. 11-12-11. S.D. 1,395 ft.

Sabine Parish

R. S. & M. Oil Co.'s No. 1 Tatum, 330 ft. S and E, NW cor. NW SE Sec. 32-8-15. P.B. to 1,590 ft. from 2,100 ft.

Jack Lent's No. 1 Williams, Sec. 13-7-11. Tested, show oil 2,675 ft.

Geo. L. Pace's No. 4 DeSoto Corp., 330 ft. S and W NE cor. SE SE Sec. 27-10-12. Set 8-in. 1,394 ft.; bailing 1,946 ft.

Pearl Oil Corp.'s No. 5 Cranford, 330 ft. N and E SW cor. SE SE Sec. 20-9-12. Comp., flowing 450 bbls., T.D. 1,663 ft.

Lee Whitehurst's No. 5 Frost Lbr. Ind., C NW SW SE Sec. 26-9-12. Set 16-in. 42 ft.; drlg. 200 ft.

Lee Whitehurst's No. 4 Frost Lbr. Ind., 660 ft. N and 330 ft. E of SW cor. Sec. 29-9-13. Comp., flowing 425 bbls. 2,069 ft.

Union Parish

Nemours Corp.'s No. 2 G. W. Haile, 660 ft. S and E, NW cor. Sec. 1-21-3e. Set 12-in. 162 ft.; set 6-in. 2,061 ft.

Webster Parish

Bennett & Eldred's No. 1 Fulbright, NE NE Sec. 1-18-10. Fshg. for D.S. 2,206 ft.

Winn Parish

Parsons et al's No. 1 Tremont Lbr. Co., 660 ft. S, 330 ft. E NW cor. SW Sec 10-12-2w. S.D. 1,120 ft.

ARKANSAS

Arkansas County

Grand Prairie Realty Co.'s No. 2 Fischer 412 ft. S, 12 ft. W, NE cor. NW NW Sec. 4-6-4w. T.A. 1,628 ft.

Ashley County

Benedum & Trees' No. 1 Holmes, C NE SW Sec. 4-17-6. Coring 2,505 ft.

Texas Seaboard Oil Co.'s No. 1 Bynum, 330 ft. N and W SE cor. SW NW Sec. Drlg. rock 2,442 ft.

Columbia County

J. G. Cubage et al's No. 1 Rhea, 150 ft. N line, 330 ft. E. SW cor. SE SE Sec. 12-17-22. S.D. 3,596 ft.

Southern States Gas Co.'s No. 1 Piney Woods Lbr. Co., 330 ft. N and E. SW cor. NE NW Sec. 10-20-22. S.D. 1,924 ft.

Dallas County

McCall & Kelly's No. 1 Ray Owen, 330 ft. S and E, NW cor. NW SW. S.D. 1,456 ft.

Hempstead County

G. L. Glass, tr.'s No. 1 May B. O'Bier, Sec. 32-12-23. Derrick.

F. W. Martin's No. 2 Lafferty, C NW Sec. 17-14-24. Rigging up.

LaFayette County

Earl F. Fox' No. 2 Coleman Bros., NE NE Sec. 30-16-24. Set 10-in. 135 ft.

Kamon & Neely's No. 1 Cockran, NW cor. SE SW Sec. 26-19-25. S.D. 4,450 ft.

Joe Modisett's No. 1 Red River Lbr. Co., C SW SW Sec. 21-19-14. Drlg. 4,360 ft.

Riggs Bros.' No. 1 Dubose, SE cor. SW NW Sec. 35-15-24. S.D. 2,800 ft.

Transportation Pet. Co.'s No. 1 Cockran. 300 ft. S and W, NE cor. SE Sec. 26-19-25. Coring 3,340 ft.

Miller County

M. D. K. Fitzwater's No. 1 E. H. Beck, 150 ft. N and E, SW cor. NW SW Sec. 34-15-26. W.O.S.R. 2,919 ft.

C. W. Hayes' No. 1 State, 316 ft. E and 200 ft. N of SW cor. SE NE Sec. 31-15-25. Arranging to abandon, 3,010 ft.

King Oil Corp.'s No. 1 G. W. Crank, SW NE Sec. 19-16-25. Drlg. 2,880 ft.

C. V. Lenz's No. 1 A. Dean, NW cor. SE Sec. 24-15-26. Drlg. 2,268 ft.

M. H. S. Oil Co.'s No. 2 Beck, Sec. 34-15-26. Rigging up.

L. H. Mahon et al's No. 1 Miller Land & Timber Co., SW cor. SE Sec. 29-18-27. S.D. 150 ft.

Nevada County

Carnett et al's No. 1 Floyd Munin, C SW Sec. 16-14-22. S.D. 50 ft.

Ouachita County

Benedum & Trees' No. 1 H. Brighton, C NE SW Sec. 29-14-19. Coring 3,212 ft.

Snow-Black Pet. Co.'s No. 1 Bedford, 680 ft. N and 150 ft. E, SW cor. Sec. 32-11-18. Derrick up on new hole.

Poinsett County

Rockwell Dev. Co.'s No. 1 W. A. Smith, NE NE Sec. 13-11n-3e. Reaming to bottom 2,410 ft.

Sevier County

Pendleton & Vaughn's No. 1 Dierke, C NW NE Sec. 14-10-29. S.D. rep. rig 100 ft.

Union County

Arkansas Southern Oil Co.'s No. 1 F. R. Laney, Sec. 30-19-16. Installing larger rig 175 ft.

J. C. Buckbee, Tr.'s No. 1 Sloan, 330 ft. N and E, SW cor. SE NW. Fshg. for 1 joint D.S. and bit 3,271 ft.

J. E. Crosbie Inc.'s No. 1 Sullivant, 200 ft. N and W SE cor. SW NW Sec. 12-17 14. Set 10-in. 132 ft.

Gardy Drlg. Co.'s No. 1 Craig, Sec. 35-17-15. Comp., flowing 10 bbls. 2,211 ft.

Mrs. R. K. Jones et al's No. 1 Davis, 330 ft. N and W, SE cor. NW NW Sec. 28-16-14. Arranging to test 3,297 ft.

Marine Oil Co.'s No. 1 W. C. Fuller, 330 ft. N and W, SE cor. SE NW Sec. 12-19-12. S.D. for water 150 ft.

Richardson & Proetz et al's No. 1 Galion Lbr. Co., 330 ft. S and E, NW cor. NW SE Sec. 10-16-14. Dry and abandoned 3,511 ft.

MISSISSIPPI

Bolivar County

White & Jones' No. 1 Ballou, SE SE NW Sec. 17-24n-7w. S.D. 1,614 ft.

Clarke County

L. Beckwith et al's No. 1 Long Bell Lbr. Co., 538 ft. S, 125 ft. W of C Sec. 16-2n-16e. T.A.; lack of funds.

Clarke County Oil Co.'s No. 1 Dora Butler, C SW SW Sec. 15-2n-16e. Set 10-in. 63 ft.

Greene County

United Gas Pub. Ser. Co.'s No. 1 William Unit, 200 ft. N, 100 ft. W, C SW Sec. 6-15-5w. Drlg. 2,550 ft.

Harrison County

Big Ridge Oil Co.'s No. 1 Hinzin, NE Sec. 12-7s-10w. S.D.; W.O. 1,100 ft.

Lafayette County

W. L. Stewart et al's No. 1 Russell, 1,320 ft. N, 1,720 ft. E, SW cor. Sec. 9-10s-1w. Drlg. 2,670 ft.

Lauderdale County

Bob Dalton's No. 1 Bounds, Sec. 34-7n-15e. S.D.; W.O. 1,600 ft.

Warren County

H. W. Elliott et al's No. 2 R. L. Parker, 780 ft. E, 1,570 ft. S, NW cor. Sec. 14-14n-1e. S.D.; W.O. 1,600 ft.

Washington County

Perkins & Dees' No. 1 Lee, 1,500 ft. E, 500 ft. N, SW cor. Sec. 33-15n-3w. S.D. 2,175 ft.

Winston County

Jack Vale et al's No. 1 Moody, 713 ft N, 667 ft. E, SW cor. NW SW Sec. 3-13n-14e. Set 6-in. 2,212 ft.

ALABAMA

Houston County

Rice O. & G. Co.'s No. 1 Oakley Est., SE cor. NW SW Sec. 9-3n-29e. S.D. 3,035 ft.

Lamar County

DeSoto O. & G. Corp.'s No. 1 Gardner, Sec. 22-15s-16w. Drlg. 4,795 ft.

Mobile County

J. C. Prine's No. 1 C. H. M. King, N½ NE Sec. 4-1n-4w. Drlg. 2,890 ft.

FLORIDA

Lake County

Oil Dev. Co. of Florida's No. 1 South Lake, SE SE Sec. 17-24s-25e. S.D. at 1,946 ft. after coring 75 ft. of lime; awaiting acid treatment.

LA.-ARK. PROVEN

NORTH LOUISIANA

Caddo—Rodessa

Ark.-La. Gas Co.'s No. 4 Rodessa Oil & Land Co., 590 ft. S, 588 ft. E, NW cor. NE Sec. 22-23-16. Drlg. lime 3,344 ft.

Ark.-La. Gas Co.'s No. 3 Rodessa O. & Land Co., 1,945 ft. S, 719 ft. W, NE cor. Sec. 22-23-16. Set 7-in. csg. 5,953 ft.; T.D. 6,000 ft.

Bartex Pipe Line Co.'s No. 1 Rodessa O. & Land Co., 660 ft. N and W, SE cor. NE SE Sec. 13-23-16. Derrick.

Danciger & Hall's No. 1 Willis C Lot 5, Blk. 7, Sec. 23-23-16. Derrick.

Eastern Texas Prod. Co.'s No. 1 Caddo School Board, CSL NE SW Sec. 23-23-16. Tested 20,000,000 ft. gas, 6,032 ft.

Haynes Prod. Co.'s No. 3 Sexton, 285 ft. S and 236 ft. W NE cor. SW NE Sec. 14-23-16. Set 12½-in. 264 ft., drlg. 708 ft.

Haynes Prod. Co.'s No. 3 Lawton, 660 ft. N, 990 ft. E, SW cor. Sec. 14-23-16. Set 9⅝-in. csg. 2,062 ft., drlg. 2,316 ft.

Haynes Prod. Co.'s No. 2 T. F. Sexton, 665 ft. N, 660 ft. E, C Sec. 14-23-16. Drlg. 4,632 ft.

Haynes Prod. Co.'s No. 2 Otwell, 660 ft. N and 330 ft. E of SW cor. Sec. 14-23-16. Reaming 5,730 ft.

W. M. Layton et al's No. 1 Tyson, 325 ft. N, 330 ft. W, C Sec. 22-23-16. Drlg. 2,633 ft.

McAlester Fuel Co.'s No. 1 Tyson, 250 ft. N, 150 ft. W, C Sec. 22-23-16. Setting 9⅝-in. 2,072 ft.

Geo. Mannahan's No. 1 T. M. Comegys, 330 ft. N and W, SE cor. NE SE Sec. 10-23-16. Drlg. 4,340 ft.

R. W. Norton's No. 2-A Caddo Levee Board, 1,320 ft. S, 660 ft. E, C Sec. 21-23-16. Drlg. 2,412 ft.

R. W. Norton's No. 1 Tyson heirs, 1,980 ft. E, 660 ft. S, NW cor. Sec. 13-23-16. Set 9-in. 5,200 ft., drlg. 5,281 ft.

R. W. Norton's No. 1 Fosque, 1,980 ft. N, 660 ft. W, SE cor. Sec. 20-23-16. Set 9-in. 5,135 ft., drlg. 5,256 ft.

Pelican Oil & Gasoline Co.'s No. 2 Sexton, 330 ft. N and E, SW cor. SE NE Sec. 14-23-16. Set 10¾-in. csg. 2,212 ft., drlg. 2,462 ft.

Pelican Oil & Gasoline Co.'s No. 3 Sexton, 330 ft. S and E, NW cor. SE NE Sec. 14-23-16. Set 10¾-in. 2,078 ft.

United Gas Public Service Co.'s No. 1 Poole, 660 ft. S and W, NE cor. Sec. 21-23-16. Drlg. 2,990 ft.

United Gas Public Service Co.'s No. 1 Ardie & Co., 660 ft. N, 1,980 ft. W, SE cor. Sec. 14-23-16. Drlg. 3,564 ft.

United Gas Public Service Co.'s No. 2 Rodessa Oil & Land Co., 660 ft. S and W, NE cor. Sec. 22-23-16. Arranging to deepen 20 ft. from 5,986.

United Gas Public Service Co.'s No. 1 Rodessa Oil & Land Co., 1,980 ft. N and 660 ft. W, SE cor. Sec. 15-23-15. P.B. to 5,965 ft. from 6,046 ft.

G. H. Vaughn Prod. Co.'s No. 1 Hunter-Derryberry, 990 ft. S, 1,804 ft. E, NW cor. Sec. 14-23-16. Coring 5,940 ft.

G. H. Vaughn Prod. Co.'s No. 1 T. M. Comegys, 330 ft. N and E, SW cor. SE SE Sec. 10-23-16. Coring 5,970 ft.

Sabine Parish—Zwolle

Alexander & Crane's No. 1 Fogman, SE cor. N½ SW NE Sec. 18-7-11. S.D. 2,655 ft.

Ivan A. Allen No. 1 Travis, 330 ft. S and W of NE cor. NE NW Sec. 13-7-11. Drlg. 2,175 ft.

H. C. Maulding's No. 1 Davis, 350 ft. N and W, SE cor. NE NE Sec. 2-7-11. S.D. 400 ft.

A. H. Turner's No. 1 Baker, 330 ft. S and E NW cor. NW NE Sec. 35-8-12. Rigging up to deepen, 4,127 ft. O.W.D.D.

EAST TEXAS

(Border Counties)

Cass County

American Liberty Oil Co.'s No. 1 J. B. Rodgers, 330 ft. N, 430 ft. W, SE cor. of 160-ac. tract in C. M. Robinson Sur. Moving in rig.

United Gas Public Service Co.'s No. 1 Thurman, 1,370 ft. S, 1,320 ft. W. NE cor. John Coleman Sur. Drlg. 2,455 ft.

Harrison County

R. C. Payne et al's No. 1 Lowery, H. D. Spain Sur. P.B. to 3,524 ft.

Marion County

Ed S. Holman's No. 1 Henderson, R. Bennington Sur. P.B. to 2,443 ft.

Panola County

R. A. Graddy's No. 1 M. J. McCormick, J. McAdams Sur. Drlg. 2,675 ft.

George Hudson et al's No. 1 J. F. Nail, C. McGeary Sur. Set 8-in. 40 ft.; fishing for core bbl. at 2,345 ft.

Geo. Le Grand's No. 1 P. J. Wardleigh, A. Thompson Sur. Set 10-in. 62 ft.

R. W. Price's No. 1 Crawford, J. A. Williams Sur. Set 10-in. 64 ft.

Fred Stovall Drlg. Co.'s No. 1 H. D. Ivey, P. Martin H.R.S. S.D. for csg. 1,930 ft.

Shelby County

Cliff Stoval's No. 1 Pickering Lbr. Co., C. H. Patterson Sur. S.D.; rig repair, 1,485 ft.

S. W. TEXAS WILDCATS

Week Ending November 2

Atascosa County

R. C. Lee's No. 1 Atascosa Trust, 160 ft. S line, 300 ft. E line, 152-ac. lease, J. T. Russell Sur. No. 1,222. Spudded in.

Robert McIntyre's No. 1 Billimek, 1,104 ft. SW line, 3,700 ft. SE line, J. D. Woodruff Sur. No. 246. Bldg. derrick.

Bandera County

Plateau Oil Co.'s No. 1 Garrison, G.C.&S. F. Sur. No. 506, 1,500 ft. from W and 2,970 ft. from N lines of survey. Drlg. shale 4,763 ft.

Bastrop County

Marts & Beaven's No. 1 Kirksey, 150 ft. NW and SW lines, 75-ac. tract, Geo. Glasscock Sur. Drlg. 1,100 ft.

Port Isabel Oil & Gas Co.'s No. 1 G. A. Smith, J. B. Blalock Sur., 600 ft. SE, NE cor. J. Doyle Sur. Spudded in.

Port Isabel Oil & Gas Co.'s No. 1 Storey, 450 ft. N and W lines, 205-ac. tract. T.D. 1,524 ft., chalk; no serpentine; abd.

Bee County

Geo. W. Church's No. 1 Hearn, 2,000 ft. S No. 1 Wood. Location.

H. H. Coffield et al's No. 1 Cornie, 250 ft. S and W lines, 130-ac. tract, Allen Sur. Drlg. water well.

Bexar County

Isa. B. Cunningham's No. 1 L. F. Ridder, 950 ft. S of Nelson Road, 1,300 ft. from E line, Block 5,196, Sur. No. 58. T.D. 860 ft.; perforated 450 ft.; trying to complete.

Dorine Oil Co.'s No. 2 Tudyk, 400 ft. E line, 260 ft. S line, 315-ac. tract, Cordenas Sur. T.D. 760 ft.; P.B. 610 ft.; reworking.

Joe Dupree's No. 2 Coffey, 995 ft. SW line, 910 ft. SE line lease, Rodriquez Sur. Drlg. 783 ft.

Morgan & Magna's No. 1 Kirkwood, Desaque Sur., 9 miles SW of San Antonio. Location.

Bert Mowinkle's No. 1 Kotsur, 434 ft. N line, 150 ft. W line, Loringville Sur. Rigged up.

Fred Thorman's No. 1 Sahn, 330 ft. E line, 600 ft. S line of tract, Sur. No. 3. Spudded in; waiting on rotary rig.

Brooks County

Winfield and Mosser's No. 1 Singer, 660 ft. N and E lines, SE¼ Sec. 312. T.D. 990 ft.; S.D.

Caldwell County

Clark & Crouch's No. 1 Jolly, 310 ft. SW line, Crenshaw Sur., 4,950 ft. NW line, House Sur. Cored Edward sand 1,337 ft.; set csg. 972 ft.; testing chalk.

J. J. Elam's No. 1 Brown, 450 ft. SE and SW lines of lease, Souvereign Sur. Derrick.

Port Isabel Oil & Gas Co.'s No. 1 Baker, 990 ft. SE line, 330 ft. SW line, 167-ac. tract, Geo. W. James Sur.
Rigged up.

Cameron County

Joseph Anderson's No. 1 Browne, 330 ft. N line, Blk. 379, San Benito Subd., Espirito Santo grant, 3 miles N Rio Hondo.
Standing 5,195 ft.
Kingwood & Daniels' No. 1 Port Isabel, Share 29.
Spudded in; S.D.

Dewitt County

Reginald F. Baurke's No. 1 W. C. Steinman Est., 937 ft. from N and S lines, Uriah Blue 1-3 League.
Drlg. 2,412 ft.
D. G. Glaspier's No. 1 Schuebel, 330 ft. from S and W lines of tract, Fitzgerald grant.
Set surface csg.; moving in larger rig.

Dimmitt County

Diamond Half Oil Co.'s No. 1 Eardley Est., 2,390 ft. SW line, 330 ft. NW line, E. A. McCorquodale Sur. No. 6.
T.D. 4,250 ft., running Schlumberger.

Duval County

J. H. Chandler's No. 1 Rita Pena, 1,335 ft. of NW line, 3,825 ft. of SW line, Share 4, Mesquite grant.
T.D. 3,460 ft.; dry and abandoned.
Magnolia Pet. Co.'s No. 1 D.C.R.C.-Santa, 330 ft. S and E lines, Sur. 155.
Drlg. 2,930 ft.
A. E. Masterson's No. 1 Rogers, 2,310 ft. NE line, 1,650 ft. SE line, 40-ac. tract, H.&G.R. R.R. Co. Sur. 15.
Moving in material.
Plymouth Oil Co.'s No. 1 Cuellar, 330 ft. NW and NE lines, Sur. 123.
S.D.; T.D. 3,128 ft.
Texas Oil Corp.'s No. 1 N.L.&L. Co., 330 ft. from S and W lines, NE¼, Sur. 101, B.S.&F. Sur.
Coring 1,836 ft.
Trinity Drillers, Inc.'s No. 1 Sweden ranch (Driscoll-Sevier), 330 ft. N and E lines, Sec. 68, Santa Rosalie grant.
Moving in material.

Edwards County

Paul Teas' No. 1 Stewart, C SE¼, Sec. 1 G.C.&S.F. Sur.
Location.

Frio County

W. D. Bacon's No. 1 Burns, 2,500 ft. S and W line, Thomas Clifton Sur.
T.D. 2,220 ft.; S.D. for drill pipe.
Midland Oil Co.'s No. 1 Halff & Oppenheimer, 330 ft. S and W lines, Sur. 11.
T.D. 4,005 ft.; dry and abandoned.

Goliad County

Hendricks et al's No. 1 Gillette, 330 ft of NW and SW lines of tract, G. Gomez Sur.
Location.
Keystone Royalty Co.'s No. 2 M. Woods 330 ft. S and E lines, SE¼ 160-ac. tract, Sec. 13, Josefa Rios Sur.
Top gas sand 5,975 ft.; T.D. 5,983 ft.; waiting on string; csg. set 5,983 ft.; S.D. for orders.
Thompson Drlg. Co.'s No. 1 Hays Taylor estate, 900 ft. SE line, 2,400 ft. W cor. 791-ac. tract, Smith Sur.
Drlg. water well.

Gonzales County

Interallied Pet. Co.'s No. 1 Wells, 1,708 ft. S line, 185 ft. W line, Sec. 3, 648-ac subvd., Wells Ranch.
Bane Sur.
Drlg. 3,550 ft.

Guadalupe County

J. E. Clark's No. 1 Larison, 150 ft. E line road, Davis Sur.
T.D. 2,473 ft., comp., no gauge, est. 300 bbls. per day.
Hopkins Bros.' No. 1 Sherrill, 150 ft. NW line, 625 ft. NE line, 300 ft. SW No. 1 Gabriel.
Location.
W. T. Scrutchin's No. 1 A. H. Smith, 150 ft. from E line, 1,350 ft. from N line of 34.5-ac. tract, Jas. B. Cowan Sur.
T.D. 835 ft.; S.D.

Hidalgo County

Downey & Morton's No. 1 Daskom, 450 ft from E line, 55 ft. from S line of Blk 94, Por. 45.
T.D. 4,115 ft.; dry and abandoned.
Gulf States Oil Co.'s No. 2 J. C. Engleman, 400 ft. S and E lines, Lot 3, Blk. 70, Las Mestanas grant.
Spudded in.
Gulf States Oil Co.'s No. 1 Delta Orchards, 580 ft. from N line, 400 ft. W line, Lot 2, Blk. 73, Las Westanas Grant.
Rigging up.
Kingwood Oil Co.'s No. 2 Osca Daskom, 723 ft. N line, 1,805 ft. E line, Blk. 90, Porc. 45, J. of Reynosa.
Moving in material.
Lenagraf-Walden-Carmen's No. 1 Brock & Showers, 330 ft. W line, 615 ft. S line, Lot 4, Blk. 12, Por. 80.
Drlg. 2,242 ft.
Maxwell-Mundy's No. 1 Southland Development Co., Lot 11, Blk. 20, Alamo Land & Sugar Co. Subd., Alamo tract, 10 miles SW McAllen.
Rigging up.
Sloan et al's No. 1 Brock & Showers, 35? ft. S and W lines, Lot 9, Blk. 16, Por. 8?
T.D. 6,003 ft.; perforations 4,666-69 ft. and 4,774-77 ft.; tested salt water; recemented to perforate at 4,640-59 ft.

Jim Hogg County

S. L. Miller Oil Co.'s No. 1 Yeager, 150 ft. E line, 477 ft. S line, Blk. 6, Sur. 20.
Drlg. 1,525 ft.

Jim Wells County

Putnam & Stewart's No. 1 Hawkins, 1,200 varas N, SW cor. lease, at R.R. and lease point, thence 1,200 varas W.
Drlg. 2,155 ft.; sand 2,070-95 ft., sulfur water.
Smith & Storey's No. 1 McGill, 660 ft. S No. 1 Dilworth.
Drlg. 250 ft.
J. E. Walsh's No. 1 Wade, 750 ft. NW line, 300 ft. NE line, Lot 3, Blk. C.
T.D 1,700 ft.; S.D. for water.

Kendall County

H. W. Martin's No. 2 Edwin Houston, I.T.&N. Sur. 598.
Location.
Southwestern Dev. Co.'s No. 1 Werner 765 ft. W line, 1,645 ft. N line, J. F. Torrey Sur. No. 781.
T.D. 972 ft., underreaming.

Kerr County

Auld and Evans' No. 1 Heffner, 660 ft. N line, 330 ft. E line, Sec. 13, B.S.&F. Sur.
Rigged up; S.D.
Eastland Oil Co.'s No. 5-E Love, 1,550 ft. E line, 300 ft. N line, Sur. 1,591.
T.D. 5,625 ft.; S.D.

Kleberg County

John Bartlett's No. 1 Anton Deitz, SE¼ SE¼ Sec. 48, K.T.&I. Subd.
Spudded in; S.D.
Fidelity Oil Co.'s No. 1 Flato, 150 ft. S and E lines, Blk. 14, Sec. 40, K.T.&I. Sur.
Location.
Fidelity Exp. Co.'s No. 1 Sam Michalk et al, 330 ft. from N line and 775 ft. from S line, Blk. 37, Sec. 5; 5 miles SE Kingsville.
Drlg. 2,990 ft.

LaSalle County

Bier & Witherspoon's No. 1 LaSalle Co., 1,320 ft. S and W lines, Sec. 19, Bland & Nelson Subd., O'Connor ranch.
Spudded in; S.D.
Roy Shipman's No. 1 Coleman, 330 ft. SW cor. Blk. 15, Sur. 514.
Spudded in.

Lee County

J. Spivey's No. 1 First National Bank, 300 ft. S and E lines, 846-ac. tract, Mack Sur.
Location.

Live Oak County

G. C. Beauchamp's No. 1 S. A. Joint Stock Land Bank, 150 ft. N and E lines, Turner Sur.
Location.
E. H. Buchner's No. 1 McNeill, 300 ft. of SW cor. of 40-ac. tract, Blk. 8, McNeill Subd.
Location.
Earl Calloway's No. 1 Lyne, 895 ft. of W line, 330 ft. of N line, SW¼ SW¼ of M. M. Lyne Sur.
Drlg. hard rock 3,455 ft.
Conway & Beuscher's No. 1 Sanger, 50 ft W line, 150 ft. SW line, 640-ac. lease, Sur. 224.
Coring for Pettus, 2,986 ft.
L. O. Gleason's No. 1 Fitzpatrick, Sur. 52.
Drlg. 50 ft.
Ogden & Reed's No. 1 Reed, 330 ft. SW and NW lines, I.&G.N. R.R. Sur. No. 5.
Location.
Santa Clara Oil Co.'s No. 1 Corbett, Sec. 2, R. H. Corbett Sur.
Location.
Trinity Drillers, Inc.-Groups' Nos. 1 and 2 Oil Corp.'s No. 1 McNeill, 60-ac. tract, Tract 1, Blk. 10, Jane Curry Sur.
Spudded in.
Wheelock & Collins' No. 1 Kirby, 1,650 ft. S line, 5,795 ft. E line, 817-ac. tract, Thos. B. Reese Sur.
Ready to spud in.

McMullen County

Aransas Oil Co.'s No. 1 Reed, 330 ft. E line, 1,320 ft. S line, Spicer Sur.
T.D. 1,680 ft.; S.D.
Darby Pet. Co.'s No. 1 Hagist, 660 ft., N and W lines, Sur. 135.
T.D. 2,500 ft.; no showings; D.&A.
C. O. Garney's No. 1 Hagist, 330 ft. N and W lines, SE¼, Sur. 6.
Location.
Marzo Oil Co.'s No. 1-B Hagist, 330 ft., S and E lines, Sec. 6.
Drlg. 1,364 ft.
Reliance Oil & Royalty Co.'s No. 1 Shiner, 330 ft. NE cor. Sec. 29, C. C. Shumway Subvd.
Moving in material.
West & Stevenson's No. 1 Fisher, 330 ft. N and W lines, O'Boyle Sur.
Set csg. 503 ft.; Drlg. plugs.

Medina County

F. Brown's No. 1 Brucks, 900 ft. W line, 660 ft. S line, Brucks tract, John Ward Sur. No. 18.
No report.
Frank Brown's No. 2 Winn, 600 ft. W line, 300 ft. N line, Ward Sur.
Spudded in; S.D.
Caroca Oil Co.'s No. 2 Roy Taylor, 660 ft. N line, 150 ft. E line, NE¼ W½ Sur. 136.
S.D. 354 ft.
Joe Dupree's No. 1 Brucks, 404 ft. N line, 165 ft. E line, Castro Sur. No. 248.
Drlg. 763 ft.
Ed Falvey's No. 1 McMenemy, 160 ft. S and W lines, Sur. 33.
Drlg. below sur. csg. 150 ft.
Gates & Hills' No. 3 Odem, 840 ft. W line, 1,975 ft. S line, Castro Sur. 174.
Drlg. 363 ft.
Letro Oil Corp.'s No. 1 E. B. Forrest 1,938 ft. from N line, 1,908 ft. from E line of 640-ac. tract, Blk. 69.
Small show oil 391 ft.; underreamed 480 ft.

Nueces County

Bluff Pet. Co.'s No. 1 Bluntzer, 330 ft. SW and SE lines, NE 1,007-ac. tract, Sec. 6, Casa Blanco grant.
Drlg. 1,820 ft.
J. K. Coulton's No. 1 Baldwin, 330 ft. N line, 485 ft. E lines, 85.3-ac. tract, Blk. 20, Russell Farm Tracts.
Comp. est. 50 bbls. per day on 5/32-in. choke, and 1,000,000 ft. gas; sand 4,069-4,082 ft.; C.P. 1,700 lbs.; T.P. 1,350 lbs.
La Jita Corp.'s No. 1 King, C SE¼ SW¼ Sec. 22.
P.B. to 4,012 ft., perforated 3,983-90 ft., running liner.
S. Nelson's No. 1 Buckholt, 990 ft. E line, 150 ft. S line, S 114.3-ac. tract, Blk. 4, Sec. 316.
Rigging up.
Santa Clara Oil Co.'s No. 1 Driscoll-Sevier, 4,456.2 ft. N line, 990 ft. E line, Wm. Gamble Sur.
Coring 2,200 ft.
H. A. Meyer's No. 1 Harney, 850 ft. W line, 225 ft. S line, 3,200-ac. tract.
Location.

San Patricio County

Benedum & Trees' No. 1 Welder, 2,640 ft. N line, 660 ft. W line, Sec. 34.
Drlg. sticky shale and lime 5,271 ft.
George E. Smith's No. 1 Britton, 330 ft. N and W lines, Lot 8, Sec. 6.
Derrick.

Starr County

Ash & Tackett's No. 1 Margo, 150 ft. S and E lines, Blk. 4, Share 3-B, Por. 70.
No report.
J. H. Clopton's No. 2 Bass, 2,460 ft. E line, Por. 87, 17,409 ft. W of Highway No. 4, Por. 87.
Drlg. 112 ft.
Cook-Maris Arnold's No. 1 S.C.C.C., 220 ft. N line, 25 ft. E line, Lot 24, Por. 89.
Set sur. csg. 40 ft.; W.O.C.
Frank Dayno's No. 1 Seabury, 1,000 ft. S line, 850 ft. E line, Tract 5, Por. 75.
No report.
Evans & James' No. 1 Ferry, 150 ft. S and SE lines lease, Por. 72.
Drlg. 1,482 ft.
McCurry & Yates' No. 1 S.C.C.C., 150 ft W line, 510 ft. N line, Blk. 58, Porc. 89.
Location.
McCurry & Yates' No. 2 S.C.C.C., 150 ft E line, 510 ft. N line, Blk. 58, Porc. 89.
Location.
Pedernal Oil Co.'s No. 1 Hicks et al, 187 ft. from NW line, 318 ft. from NE line of Blk. 6, Pedernal Grant.
T.D. 2,210 ft.; S.D.

Webb County

Austin & Vernon's No. 1 Jeffries, 150 ft NE line, 1,170 ft. SE line, Blk. 13, Sur 1,453.
Set surface csg.; S.D.; T.D. 40 ft.
E. T. Burton's No. 1 Billings, NE cor of SW¼, Sur. 113.
Location.
Clopton & Doffing's No. 1 Slator, center Blk. 29, Borrego grant.
No report.
D. E. C. Oil Co.'s No. 1 Slater, C Blk. 50 Sur. 15, Arispe grant.
No report.
French Oil Co.'s No. 1 Juan Guerra, 1,650 ft. SE line, 330 ft. SW line, Sur. 334.
T.D. 3,010 ft.; dry and abandoned.
O. W. Killam's No. 1 Ortiz, 200 ft. SE line, 3,350 ft. S.W. road, Porc. 17.
Drlg. 230 ft.
Magnolia Pet. Co.'s No. 1 Garcia-Arriba 330 ft. S and E lines, Blk. 8, Albercas grant.
Drlg. 375 ft.
J. E. Neal's No. 1 Laurel Bros., 1,320 ft of S and E lines, Sur. 1,119.
Rigged up; standing.
Magnolia Pet. Co.'s No. 1 Volpe Bros. 330 ft. N and W lines, Sur. 38b.
Coring hard sand 3,902 ft.
Arthur H. Wray's No. 1 Geo. Stuemcke, Share 1, Brewster pasture, Galan grant
Coring sand 2,100 ft.
S. S. & B. Oil Co.'s No. 6 Lone Star Co., 7,700 ft. NE line, 330 ft. SE line, Por. 12.
Drlg. 180 ft.

Willacy County

Kingwood Oil Co.'s No. 1 Santa Rosa, Inc., 160 ft. from E line, 637 ft. from S line of Sec. 30, Blk. 16, Share 44, San Juan de Carricitas grant.
T.D. 6,526 ft.; running csg.
L. & S. Drlg. Co.'s No. 2 Armendias, near Rio Hondo, 7,798 ft. from E and W lines of Share 14.
Fishing 5,240 ft.

Zapata County

H. F. Crows' No. 1 B. Uribe, Blk. 5, Share 11, Partitions 4 and 5, San Ignacio Subd., Borrego grant.
Abnd. location.
Murt Cullinan's No. 1 Gutierrez, Blk. 4, Share 2, Fansler Partition, Comitas Grant.
Location.
J. J. O'Hern's No. 1 Raymond, 330 ft. NW line, 330 ft. NE line, Blk. 5, Share E, Por. 27.
Drlg. 1,305 ft.

S. W. TEXAS PROVEN

Week Ending November 2

Caesar—Bee County

Caesar Oil Co.'s No. 6 R. E. Miller, N offset to Commodor's No. 4 Grissom.
Location.
C. Echols' No. 1 Hudman, 150 ft. N and W lines, 10-ac. tract.
Drlg. 2,800 ft.
Sun Oil Co.'s No. 1 Barroum, 990 ft. N line, 330 ft. E line lease.
Location.

Dirks—Bee County

Heyser, Heard & Walton's No. 11 Young, 496 ft. N No. 8, 330 ft. W line lease, Rawlins Sur., Abstract 290.
Completed, no gauge, csg. 3,890 ft.
Illinois Pet. Co.'s No. 2 Rapp, 330 ft. N line, 66-ac. tract, 660 ft. W No. 1 Rapp, C. A. Dugat Sur.
Location.
Illinois Pet. Co.'s No. 3 Rapp, 330 ft. N line 66-ac. tract, 660 ft. W No. 2 Rapp, C. A. Dugat Sur.
Location.
Mills Bennett's No. 3-A Rapp, 610 ft. E No. 4, 375 ft. NE No. 3, Dugat Sur.
Top Pettus 3,825 ft.; coring 3,840 ft.
Mills Bennett's No. 4 Rapp, 330 ft. NE and NW lines lease, Dugat Sur.
Sand 3,866-68 ft. and 3,870-75 ft.; comp. 16 bbls. per hour on ¼-in. choke, T.P. 490 lbs., C.P. 810 lbs.
Sun Oil Co.'s No. 4 Page, 660 ft. NE No. 2 Page, 330 ft. SE line lease, Young Sur.
Location.
Texas Co.'s No. 10 Young, T. J. Butler Sur.
Comp. 16 bbls. per hour, on 1/16-in. choke, T.P. 530 lbs., C.P. 700 lbs.
Texas Co.'s No. 11 Young, 660 ft. E No. 10, T. J. Butler Sur.
Drlg. 3,030 ft.
Texas Co.'s No. 9 Young, 660 ft. NE No. 6, 660 ft. NW No. 7.
Drlg. 300 ft.
Wrightsman's No. 8 Bassinger, 330 ft. NE and NW lines, NW¼ Sec. 7.
Set csg. 3,840 ft.; W.O.C.

Ray—Bee County

Duncan et al's No. 1 Campbell, 150 ft. S and E lines, W half, Lot 13, Blanchard Sur. 133.
Sand 3,936-42 ft.; comp. 38 bbls. per hr. on ¼-in. choke; T.P. 750 lbs., C.P. 900 lbs.
Simms Oil Co.'s No. 1-B Campbell, 150 ft. S and E lines, Lot 19, Bucher Subd., W. B. Blanchard Sur.
Location.
Sun Oil Co.'s No. 3 Ray, 640 ft. W No. 2 Ray.
Rigged up.
Woods & Young's No. 1 Ray, 2,030 ft. NE line, 330 ft. SE line, Blanchard Sur. 132.
Pettus sand 3,939-42 ft.; comp. 26 bbls. per hr., open tubing.
R. J. Worthington's No. 1 Chestnut, 330 ft. NW cor. 40-ac. tract, B. O. Hadley Sur.
Spudded in; S.D.

Rutledge—Bee County

Worth Oil Co.'s No. 4 Rutledge, 660 ft. S No. 2 Rutledge, Hadley Sur.
Location.

Tulsta—Bee County

H. Y. Oil Co.'s No. 2 Ray, 310 ft. N line, 150 ft. W line, Blanchard Sur.
Rigging up.
Highland Oil Co.'s No. 4 Campbell, 40-ac. tract, B.&B. Sur.
Spudded in.

Palo Blanco—Brooks County

United Prod. Co.'s No. 1 Kathleen Jones Hocker, 1,300 ft. SW of No. 2, 1,636 ft. from N line of Los Mogueijes de Palo Blanco grant.
Sand 3,030-37 ft.; T.D. 5,351 ft.; standing.

Government Wells Pool—Duval County

Gilcrease Oil Co.'s No. 1 R. P. McLean, 330 ft. S and E lines, N½ NE¼ Sur. 62.
Sand 2,528-54 ft.; comp. on pump.
Government Wells Oil Corp.'s No. 1 Lundell, Sur. 48.
Rigged up.
Magnolia Pet. Co.'s No. 9 Johnson, center ½, E½, Sur. 44.
Location.
Sun Oil Co.'s No. 1 Sutherland, 990 ft. S and W lines, Sec. 122.
Location.

Kohler—Duval County

California Co.'s No. 1 Kohler, 330 ft. N line, 2,597 ft. W line tract.
Drlg. 2,795 ft.; sand 2,728-35 ft.; tested salt water.

Labbe—Duval County

Magnolia Pet. Co.'s No. 2 Labbee, 1,650 ft. W line, 990 ft. S line, Sur. 2.
Sand 2,480-85 ft.; set csg. 2,482 ft.; W.O.C.
Stanolind O. & G. Co.'s No. 2 Farmers Life, 330 ft. N line, 3,327 ft. E line, E. R. Gray Sur., Sec. 416.
Set surface csg. 313 ft.; W.O.C.

Loma Novia—Duval County

Bridwell Oil Co.'s No. 2 B.C.C., 990 ft. S line, 2,310 ft. E line, Sec. 76.
No report.
Buchanan & Blanco Oil Co.'s No. 1-B Ruiz, 185 ft. N line, 1,650 ft. E line, Sur. 73.
Location.
R. DeLange's No. 1 Duvon, SW¼ NE¼ Sur. 76.
Comp. 7 bbls. per hr., open tubing; T.D. 2,751 ft.
Eastern States' No. 2 Hubbard, NW cor. SW¼ Sur. 71.
Sand 2,641-47 ft.; T.D. 2,647 ft.; drlg. plugs.
Frank Gravis, No. 2 Byland, 330 ft. S and E lines, Blk. 4, Sur. 78.
Location.

Frank Gravis' No. 1 Eckdahl, 199 ft. E line, 400 ft. S line, Blk. 7, Sur. 78. Location.

Gilcrease Oil Co.'s No. 1 Byland, Blk. 3, Sur. 78. Location.

Hamill, Smith & Ogden's No. 2 Hahl, 200 ft. W line, 330 ft. N line, 14.5-acre tract, Sur. 78.
Comp. 30 bbls. per hour, T.D. 2,644 ft.

Rodney DeLange's No. 3 Hahl, Blk. 5, Sur. 78. Location.

Hamill, Smith & Ogden's No. 3 Hahl, 330 ft. N line, 200 ft. E line, 18.3-ac. tract; Sur. 78. Location.

Hamill, Smith & Ogden's No. 4 Hahl, 330 ft. N and W lines, 18.3-ac. tract, Sur. 78. Location.

Hamill, Smith & Ogden's No. 11 Hubbard, 330 ft. NE cor. SW¼ NW¼ Sur. 77.
Sand 2,620-40 ft.; comp. 23 bbls. per hr., on ½-in. choke.

Hamill, Smith & Ogden's No. 13 Hubbard 330 ft. N and E lines, NE¼, SE¼, Sec. 77. Derrick.

Hamill, Smith & Ogden's No. 14 Hubbard, 330 ft. S and E lines, NE¼, SE¼, Sec 77.
Rigged up; S.D.

Hamill, Smith & Ogden's No. 22 Hubbard, 330 ft. NW cor. SE¼ NW¼ Sur. 77.
Drig. 2,073 ft.

Hamill, Smith & Ogden's No. 23 Hubbard, 330 ft. SW cor., NE¼, NW¼, Sur. 77. Derrick.

Hamill, Smith & Ogden's No. 26 Hubbard, 330 ft. SE cor. NE¼ NW¼ Sur. 77.
Drig. 1,660 ft.

Hamill, Smith & Ogden's No. 32 Hubbard, 330 ft. SE cor. SE¼ SW¼ Sur. 77. Location.

Highland Oil Co.'s No. 4 Hubbard, SE¼, Sur. 75. Location.

Highland Oil Co.'s No. 3 Hubbard, 330 ft. N line, 990 ft. W line, SE¼ Sur. 75.
Comp., jetting 150 bbls. per day; T.D. 2,572 ft.

Humble O. & R. Co.'s No. 4-C Welder, 660 ft. S line, 1,320 ft. W line, Sur. 554.
T.D. sticky shale 2,458 ft.; S.D. for repairs.

Lipscomb & Daubert's No. 2 Hubbard, 330 ft. S and E lines, S½ NE¼ Sur. 75.
Set csg. 2,626 ft.; drig. plugs.

Lipscomb and Daubert's No. 3 Hubbard, 330 ft. N line, 990 ft. E line, S½ NE¼ Sur. 75. Rigging up.

Magnolia Pet. Co.'s No. 1-C Magnolia-Hahl, Blk. 9, Sur. 78.
Setting liner, 2,555 ft.

Magnolia Pet. Co.'s No. 9 Hahl, 330 ft. N line, 2,645 ft. E line, 640-ac. tract, Sur. 67.
Sand 2,601-06 ft.; comp. 30 bbls. per hr. through ½-in. choke.

Reynosa Oil Co.'s No. 3-B Mary Davison, 1,650 ft. E line, 330 ft. S line, Sur. 114. Location.

Reynosa Oil Co.'s No. 2-B Davison, 330 ft. S line, 990 ft. E line, Sur. 114.
Drig. 2,025 ft.

Russ Pet. Co.'s No. 5-D Hahl, Sur. 64.
Set csg. 2,540 ft.; W.O.C.

Russ Pet. Co.'s No. 1 Duke, 330 ft. N and W lines, 40-ac. tract, Sec. 64, J. Poitevent Sur. Location.

Shell Pet. Corp.'s No. 9 Hubbard, 990 ft. S line, 2,263 ft. E line, 320-ac. tract, Sur. 77.
T.D. shale 2,729 ft.; preparing to swab.

Shell Pet. Corp.'s No. 10 Hubbard, 993 ft. S line, 330 ft. E line, 320-ac. tract, Sur. 77.
W. O. Rig.

Shell Pet. Corp.'s No. 11 Hubbard, 330 ft. N and W lines, 320-ac. tract, Sur. 77.
Drig. shale 1,200 ft.

Stieren Oil Co.'s No. 8 Wright, 990 ft. S and E lines, 320-ac. tract, Sur. 72.
Sand 2,684-97 ft.; comp., no gauge.

Sun Oil Co.'s No. 1 Hubbard, 330 ft. N and W lines, 174-ac. tract, Sur. 84.
T.D. 2,951 ft.; dry and abandoned.

Texas Co.'s No. 8 Hahl, Blk. 8, Sur. 78. Location.

Texas Co.'s No. 10 Vela, Sur. 42. Location.

Texas Co.'s No. 2-B Ruiz, 330 ft. S and W lines, Sur. 41.
Top sand 2,555 ft.; swabbing.

Texas Co.'s No. 10 Wendt, 330 ft. S line, 1,650 ft. W line, Sur. 68.
Sand; 2,642-71 ft. csg.; comp. 24 bbls. per hr.; T.D. 2,671 ft.; ¾-in. choke.

Texas Co.'s No. 6 Hahl, 330 ft. N and E lines, Blk. 7, Sur. 78.
Comp. 32 bbls. per hr. on ¾-in. choke; Sand 2,579-2,606 ft.

Texas Co.'s No. 7 Hahl, 330 ft. S and W lines, Blk. 8, Sur. 78.
Spudded in.

The Texas Co.'s No. 3 Wendt, 660 ft. W No. 1 Wendt, 330 ft. N line, 458-ac. tract, Sur. 68. Location.

Texas Co.'s No. 4 Wendt, 660 ft. N No. 2, 660 ft. E No. 1, 458-ac. tract, Guffy Sur. Location.

Texas Co.'s No. 5 Wendt, 660 ft. W No. 3, 330 ft. N line, 458-ac. tract, Guffy Sur. Location.

Texas Co.'s No. 6 Wendt, 660 ft. W No. 5, 330 ft. N line, 458-ac. tract, Guffy Sur. Location.

Texas Co.'s No. 7 Wendt, 660 ft. E No. 2, 330 ft. N line, 458-ac. tract, Guffy Sur. Location.

Piedras Lumbre—Duval County

Texas Co. and Ohio Fuel Co.'s No. 1 D.C.R.C., 336 ft. N and W lines, Sec. 96. Coring 2,149 ft.

Piedras Pintas—Duval County

P. K. Kelly's No. 1 Tinney, 200 ft. E line, 1,100 ft. N line, Sur. 8.
Sand 800-05 ft.; standing.

Samosa—Duval County

Seaport Oil Co.'s No. 16-A D.C.R.C., Sur. 574.
Sand 2,377-2,410 ft.; set csg. W.O.C.

Seven Sisters—Duval County

Atlantic Oil Prod. Co.'s No. 1-B Welder, 330 ft. N and W lines, W½ SE¼ Sur. 385.
Cored sand, D.S.T. 10 min.; showed 1,800 ft. oil.

Buchanan-Blanco Oil Co.'s No. 2 Wood-Welder, 997 ft. E line, 330 ft. N line, 82.1-ac. tract, Sec. 385.
Coring oil sand 2,470 ft.

Daube & Westheimer's No. 1-Z Campos, 330 ft. S and W lines, Sur. 224.
Spudded in.

Duice Oil Co.'s No. 4 Serna, 660 ft. E No. 3, Sur. 354.
Drlg. 2,320 ft.

Humble O. & R. Co.'s No. 3 T. O. Smith, Sur. 382.
Derrick.

Humble O. & R. Co.'s No. 1 Badgley, 330 ft. S and E lines, Sur. 207.
T.D. 2,894 ft.; dry and abandoned.

Mid-Continent Pet. Corp.'s No. 2 Serna, S½ N½ Sur. 384.
S.D. for water; T.D. 1,865 ft.

T. P. Morgan's No. 1 Wood-Welder, Sur. 591. Location.

Santa Clara Oil Co.'s No. 10 Wood-Welder, 900 ft. S and E lines tract, Sur. 385.
T.D. 2,492 ft.; set csg. 2,487 ft.; W.O.C.

Shell Pet. Corp.'s No. 1 Wood-Welder, 330 ft. N and E lines, 80-ac. tract, W½ SW¼, Sur. 385.
Rigging up.

Hords Creek—Goliad County

Brown & Wheeler, Inc.'s No. 1 Kauffman, 1,650 ft. NW line, 330 ft. NE line, 4,-265.06-ac. tract, Trevino Sur.
Moving on to deepen.

Sun Oil Co.'s No. 1 Kaufman, 990 ft. SE line, 330 ft. SW line lease, Trevino Sur. Rigging up.

North Pettus—Goliad County

Jane Oil Co.'s No. 5 Smith, 990 ft. SW line, 330 ft. SE line, B.&B. Sur. No. 25. Derrick.

Southwest Darst Creek—Guadalupe

Kniffin & Gallagher's No. 1 Lay, 620 ft. W line, 154 ft. S line, 20-ac. tract, Davis Sur.
Comp., no gauge, est. 1,000-1,500 bbls. per day.

Mercedes—Hidalgo County

Union Sulphur Co.'s No. 5 American Rio Grande L. & I. Co., 230 ft. N line, 350 ft. W line, Tract 2,082.
Killed to rework; P.B. to 7,400 ft. to be sidetracked.

Union Sulphur Co.'s No. 6 American Rio Grande L. & I. Co., Tract 2,358, Blk. 49.
Drlg. shale and lime 6,720 ft.

Samfordyce—Hidalgo County

J. H. Anderson's No. 1 Guerra, 232 ft. N line, 285 ft. W line, Tract 254, Por. 39. Location.

Cortez Oil Co.'s No. 2 Guerra, Tract 12, Porc. 41.
Drlg. 1,930 ft.

Cortez Oil Co.'s No. 2-C Smith, 230 ft. from N line, 690 ft. from W line of NE 40 acres of Tract B-3, Porcion 41. Location.

Cortez Oil Co.'s No. 3-C Smith, 230 ft. from N line, 1,150 ft. from W line of NE 40 acres of Tract B-3, Porcion 41. Location.

Ralph E. Fair, Inc.'s (Kingwood) No. 4 Guerra, 165 ft. S line, 1,150 ft. E line Share 12, Por. 41. Location.

Ralph E. Fair, Inc.'s (Kingwood) No. 4 J. Lawrence, 300 ft. from N line, 150 ft. from W line of W 40-ac. tract 274, Por. 39.
No report.

Harrison, Davis & Bishop's No. 1 Guerra, 230 ft. S line, 616 ft. W line, S 40-ac., Tract 12, Por. 41. M.I.M.

Harrison-Davis-Bishop's No. 6 Guerra, 230 ft. N and E lines, 40-ac. tract, Tract 12, Por. 41.
Spudded in.

Harrison-Davis-Bishop's No. 7 Guerra, 230 ft. N line, 623 ft. E line, 40-ac. tract, Tract 12, Por. 41. Location.

Harrison-Davis-Bishop's No. 8 Guerra, 230 ft. N line, 1,083 ft. E line, 40-ac. tract, Tract 12, Por. 41. Location.

Harrison-Davis-Bishop's No. 9 Guerra, 230 ft. N and W lines, 40-ac. tract, Tract 12, Por. 41. Location.

Hill & Hill's No. 1 Guerra, 150 ft. S and W lines, NE 12.5-ac., S 75-ac.; Tract 254, Porc. 40. Location.

W. F. Lacey's No. 1 Seabury, 320 ft. N and W lines, NE 10-ac., SE 51-ac., Tract 256, Por. 38.
Coring for sand 2,740 ft.

W. F. Lacey's No. 2 Seabury, 250 ft. N and E lines, NE 10-ac., SE 51-ac., Tract 256, Por. 38. Location.

W. F. Lacey's No. 1 Lula George, 75 ft. S and W lines, 5-ac. tract, Tract 13, Por. 41. Location.

W. F. Lacey's No. 2 Lula George, 75 ft. S and W lines, 10-ac. tract, Tract 13, Por. 41. Location.

W. F. Lacey's No. 3 Lula George, 75 ft. S line, 550 ft. W line, 10-ac. tract, Tract 13, Por. 41. Location.

Mundy & Sons' No. 1 Guerra, 853 ft. W line, 1,275 ft. N line, Tract 12, Por. 41.
Sand 2,937-51 ft.; jetting with gas; no gauge.

E. Powell's No. 2 Lula George, 230 ft. S and E lines, 20.11-ac. tract, Tract 13, Por. 41.
Drlg. 448 ft.

Showers & Moncrief's No. 2 Guerra, Tract 254, Por. 39.
Drlg. 2,260 ft.

North Pettus—Karnes County

Magnolia Pet. Co.'s No. 10 Porter, 330 ft. SW line of lease, 660 ft. NW No. 1.
Oil sand 3,670-80 ft.; swabbing with 2,000 ft. fluid in hole.

Kingsville—Kleberg County

Fidelity & Culbertson Exploration Co.'s No. 2 Henry, Lot 2, Blk. 49. Location.

Dinero—Live Oak County

Smith & Storey's No. 2 Dinero Townsite, Jane Curry Sur.
Drlg. 5,150 ft.

Fort Merrill—Live Oak County

Slick-Urschel Oil Co.'s No. 1 Watson & Shipp, 330 ft. NE line, 990 ft. SE line lease, offset Mills Bennett's No. 1 discovery well.
Waiting on gasoline rig.

McNeill—Live Oak County

Benco Oil Corp.'s No. 1 E. Mahoney, 155 ft. from NW line of J. H. Harvey tract, 3,109 ft. SW of highway in Mark Killelly Sur.
S.D. 75 ft.

Lion Oil Ref. Co.'s No. 1 Dobie, 990 ft. N and W lines, 410-ac. tract, G.H.&H. Sur.
T.D. 5,908 ft.; S.D.

Luray Oil Co.'s No. 1 Little, NE offset. Whittington's No. 2 Little, M. M. Shipp Sur.
Drlg. 2,810 ft.

J. O. Whittington's No. 4 Little, 990 ft. S and E lines, Shipp Sur. Location.

Jacob Pool—McMullen County

L. O. Ormsby's No. 3 Jacob, 1,000 ft. NE line, 150 ft. SE line, Sparks Sur. 9.
Spudded in.

Loma Oil Co.'s No. 41-A Jacob, 660 ft. N No. 40-A.
Spudded in.

Texas Inland Oil Co.'s No. 1-B Lark, 150 ft. N and E lines, O'Boyle Sur.
Sand 963-82 ft.; set csg.; W.O.C.

Baldwin—Nueces County

Gilcrease Oil Co.'s No. 2 Sanders, 330 ft. S and E lines, 100-ac. tract, B.S.&F. Sur. No. 165.
Drlg. 3,255 ft.

Houston Oil Co.'s No. 4 Baldwin, 330 ft. N and E lines 425-ac. tract, B.S.&F. Sur. No. 165. Location.

Magnolia Pet. Co.'s No. 4 Baldwin, 330 ft. N and W lines, 1,005-ac. tract, Sur. 165.
Set csg. 1,028 ft.; W.O.C.

Magnolia Pet. Co.'s No. 2 Sanders, 330 ft. N and E lines, 100-ac. tract, B.S.&F. Sur. 165. Derrick.

Saxet—Nueces County

Conservative Oil Co.'s No. 2 K. Hutchins, 330 ft. S line, 430 ft. W line, Blk. 29.
Drlg. 455 ft.

Houston Oil Co.'s No. 2 Isensee, 330 ft. S and E lines, 40-ac. tract. Derrick.

Houston Oil Co.'s No. 5 Macgregor, 330 ft. SW cor., 135-ac. tract, 660 ft. NW No. 4, Sur. 211.
Sand 4,863-71 ft.; 15 min. D.S.T.; 1,530 ft. oil; W.P. 100 lbs.

Magnolia Pet. Co.'s No. 2 Sanders, 330 ft. SW cor. 110-ac. tract, Sec. 165, B.S.&F. Sur. Derrick.

Republic Natural Gas Co.'s No. 11 Dunn, 330 ft. S line, 660 ft. SE No. 10.
Spudded in.

Shell Pet. Corp.'s No. 1 Fiato, 330 ft. W line, 500 ft. Tex.-Mex. R.R., 40-ac. tract No. 1, Dunn Sur.
Comp. 23.5 bbls. per hr. on 5/16-in. choke; T.D. 4,555 ft.; C.P. 425 lbs.; T.P. 325 lbs.

Shell Pet. Corp.'s No. 2 Isensee, 330 ft. S and W lines of 136-ac. tract C. Land Sur
Top sand 4,546 ft.; drlg. oil sand 4,551 ft.

Southern Minerals Corp.'s No. 1-A Isensee, 330 ft. E line, 990 ft. N line, 47-ac. tract, Sur. 404. Derrick.

Southern Minerals Corp.'s No. 3 Sally Page, 330 ft. S and E lines, 75-ac. tract, Sur. 586. Location.

Texon Royalty Co.'s No. 2 Isensee, center 15-ac. tract, 900 ft. N No. 1.
Drlg. 515 ft.

Plymouth—San Patricio County

Heep Oil Corp.'s No. 4-F Welder, 728 ft. S No. 5-F, 752 ft. N No. 3-F, 200-ac. tract "F." Sec. 46.
Top gas sand 5,578 ft., coring hard sand 5,631 ft.

Heep Oil Corp.'s No. 3-F Welder, 466 ft. S line, 1,399 ft. E line, Sec. 46.
Csg. set 5,640 ft., perf. 5,635-39 ft.; comp., no gauge; T. & C.P. 900 lbs.

Magnolia Pet. Co.'s No. 3 Corpus Christi Bank, 660 ft. S No. 2.
Drlg. sticky shale, 5,370 ft.

Plymouth Oil Co.'s No. 21-C Welder, 466 ft. W line, 2,332 ft. S line, Sec. 71. Location.

Plymouth Oil Co.'s No. 17-C Welder, 2,000 ft. E line, 189 ft. S line, Sec. 50.
Comp., 210 bbls. per day; T.D. 5,651 ft.; T.&C.P. 600 lbs.

Plymouth Oil Co.'s No. 18-C Welder, 3,501 ft. N line, 1,431 ft. W line, Sec. 48.
T.D. 5,629 ft.; perf. csg.; prepare to test.

Plymouth Oil Co.'s No. 19-C Welder, 2,-307 ft. W line, 3,116⅓ ft. N line, Sec. 48.
Drlg. shale and lime 3,660 ft.

Plymouth Oil Co.'s No. 20-C Welder, 2,332 ft. W line, 1,968 ft. N line, Sec. 48.
Rigging up.

Sun Oil Co.'s No. 2 Hunt, Blk. 34, Lot 5. Set sur. csg.; W.O.C.

Sun Oil Co.'s No. 1 Hunt, 466 ft. N and W lines lease, Sec. 34.
Comp., I.P. 8 bbls. per hr. on ½-in. choke; T.P. 1,130 lbs.; C.P. 1,900 lbs.

Barbacoas—Starr County

T. K. Irwin et al's No. 1 S.C.C.C., 150 ft. S and W lines, Blk. 58, Por. 89.
Cored sand 2,648-50 ft.; good show; set csg. 2,648 ft.; W.O.C.

Rio Grande—Starr County

Hiram Reed's No. 1 Davis, 835 ft. W line, 150 ft. S line, Lot 16, Tract 78, Por. 81.
Drlg. 1,387 ft.

W. W. Zimmerman's No. 3 D.&C., 522 ft. W line, 450 ft. S line, Blk. 1, Tract A-77, Por. 81.
T.D. 1,467 ft.; S.D.

Samfordyce—Starr County

Phillips & Barnsdall's No. 3 Yturria S. & S. Co., 2,080 ft. S line, 330 ft. W line, 110-ac. tract, Por. 100.
Rigging up.

Phillips & Barnsdall's No. 2 Yturria Sand & S. Co., 1,420 ft. S line, 330 ft. W line, Sand 2,813-22 ft.; comp. 55 bbls. per hr. on ⅝-in. choke; T.P. 140 lbs.

Porter & Pickens' No. 1-B Garcia Land & Cattle Co., 330 ft. N line, 380 ft. E line, 60-ac. tract, NW cor. Blk. 4, Porc. 100.
Saidded 50 ft. from dry test.

Porter & Pickens' No. 1-B Garcia Land & Cattle Co., 330 ft. N and E lines, 60-ac. tract, NW cor. Blk. 4, Por. 100.
Perforated 2,785-95 ft.; flowed salt wtr.; 500 lbs. pressure; dry and abandoned.

Porter & Pickens' No. 2-B Garcia Land & Cattle Co., 330 ft. N and W lines, 60-ac. tract, NW cor. Blk. 4, Por. 100. Location.

Porter & Pickens' No. 3-B Garcia Land & Cattle Co., 330 ft. W line, 914 ft. S line, 60-ac. tract, Blk. 5, Por. 100. Location.

Skelly Oil Co.'s No. 7 Seabury, 219 ft. S line, 331 ft. W line, NW 20-ac. tract, Tract 256, Por. 38.
Cored oil sand 2,773-91½ ft.; set csg.; W.O.C.

Skelly Oil Co.'s No. 8 Seabury, 219 ft. N line, 198 ft. W line, 12-ac. tract, Tract 256, Por. 38. Location.

Skelly Oil Co.'s No. 9 Seabury, 330 ft. N line, 230 ft. W line, 24-ac. tract, Tract 256, Por. 38. Location.

Skelly Oil Co.'s No. 10 Seabury, 440 ft. N line, 230 ft. E line, 24-ac. tract, Tract 256, Por. 38. Location.

Skelly Oil Co.'s No. 6 Seabury, 219 ft. S line, 248 ft. E line, E 15-ac., NW 30-ac., S 263.8-ac., Tract 256, Por. 38, J. of Reynosa. Location.

Bruni—Webb County

O. W. Killam's No. 42 Bruni, Blk. 30, Sur. 15, Arispe grant. Location.

Lopez—Webb County

C. F. Lewis' No. 2 Lopez, 330 ft. N and W lines, Sur. 110. Location.

Mills Bennett Prod. Co.'s No. 3 M. Lopez, 330 ft. N and W lines, 100-ac. tract, Sur. 73. Location.

Mills Bennett Prod. Co.'s No. 1 A. Lopez, SW cor. tract, Share 13, Tract 111. Location.

Mills Bennett Prod. Co.'s No. 2 M. Lopez, 2,310 ft. E line, 611 ft. S line, 100-ac. tract, Sur. 73.
Sand 2,207-16 ft.; comp. 296 bbls. per day on ½-in. choke.

G. G. Mortimer's No. 3 M. Lopez, Sur. 73. Location.

G. G. Mortimer's No. 1-A J. Lopez, 990 ft. W line, 330 ft. S line, Sur. 111. Location.

Nixon & Tabot's No. 1 Billings, 990 ft. E line, 975 ft. S line, Sur. 113.
Rigging up.

Superior Oil Co.'s No. 1 Billings, 330 ft. N and E lines, Sur. 109.
Drlg. 500 ft.

West Cole Pool—Webb County

James P. Goslin's No. 2 Benavides, 347 ft. NW line, 313 ft. SW line, Blk. 220.
Drlg. 1,370 ft.

R. E. Misener's No. 1 Garza, 320 ft. E line, 200 ft. S line, NW¼ SE¼ Sur. 457.
T.D. 2,504 ft.; dry and abandoned.

Laurel—Webb County

South Texas Oil Co.'s No. 2 Laurel, Sur. 248.
Coring 1,963 ft.

West and North Texas

By
L. E. BREDBERG

MAY ABANDON WILDCAT TEST IN NORTH ANDREWS COUNTY

FORT WORTH, Tex., Nov. 4.—Cleaning out the Yoakum County wildcat on the Bennett ranch, proposed abandonment of an interesting wildcat in northern Andrews County, and making of a well as an extension to Keystone Field, Winkler County, were the features of the week.

C. J. Davidson and Honolulu Oil Co.'s No. 1 L. P. Bennett, Section 678, Block D, J. H. Gibson Survey, Yoakum County wildcat, drilled plug after cementing 7-inch casing at 4,651 feet and standing shut down for about two weeks cemented, and has cleaned out and is preparing to make a test with around 3,000 feet of fluid in the hole, mostly oil, and oil still rising. Total depth is 5,090 feet. Some think it might be showing oil from the Ordovician lime, which produces in Reagan County deep wells. Texas Pacific Coal & Oil Co. and the joint owners hold 8,800 acres around the well, with few pieces open near it. Other tests are rumored as the result of this strike and since the Gaines County test of Walsh and others on the Averitt ranch, southwest in Gaines County, topped the Yates sand and struck some gas at 2,785 feet, picking up an increase at 2,795 feet. Location is in Section 228, Block G, W.T.R.R. Survey, about 2½ miles northwest of Seminole. Total depth is 2,818 feet. Casing will be run.

L. G. Stogner is making location for a wildcat about 10 miles south of the Averitt test and about 4 miles northeast of his test now proposed for abandonment in northern Andrews County. The new test will probably be located in Section 22, Block A-21, about 8 miles south of Seminole. According to reports he will abandon his No. 1 Mrs. Cora George, in Section 25, Block A-22, about 7 miles northwest of the Means Pool in Andrews County, although this test has had several good showings of oil and is standing with 300 feet of fluid in the hole, partly oil. Total depth is 5,110 feet. It had showings in lime at 4,230-50 feet, 4,281, 4,335-45 and from 4,812-23 feet. Elevation is 3,253 feet and original contract depth was 5,000 feet, but due to the showings it was carried 110 feet below that.

Winkler County Extension

Sid Richardson's No. 1 Jenkins, southeast corner of Section 13, Block 77, P.S.L. Survey, came through as a commercial producer, extending the Walton-Keystone area 1½ miles northwest. Bottom of the hole is 3,498 feet and it was shot with 320 quarts, showing no water. This makes the acreage in this direction look more favorable than south and southeast, where eight wells and two dry holes have been drilled, the two dry holes being on the extreme southeast side of the block held by Gulf Production Co. The Jenkins well made 50 bbls. every six hours by heads, and is estimated good for at least 250 bbls. per day with 750,000 feet of gas. Drilling deeper may make a better well, but danger of salt water may preclude this.

The Brown and Altman area south of Kermit is being extended a half mile northwest by Westbrook Oil Corp.'s No. 1 Brown and Altman, Section 5, Block B-5, Winkler County. It is bottomed at 3,207 feet, spraying oil with an estimated 20,000,000 feet of gas. It will be given a shot. It showed oil at 2,937-40 feet, an increase from 3,010-18 feet and another at 3,120-25 feet, making a head when testing at 3,190 feet.

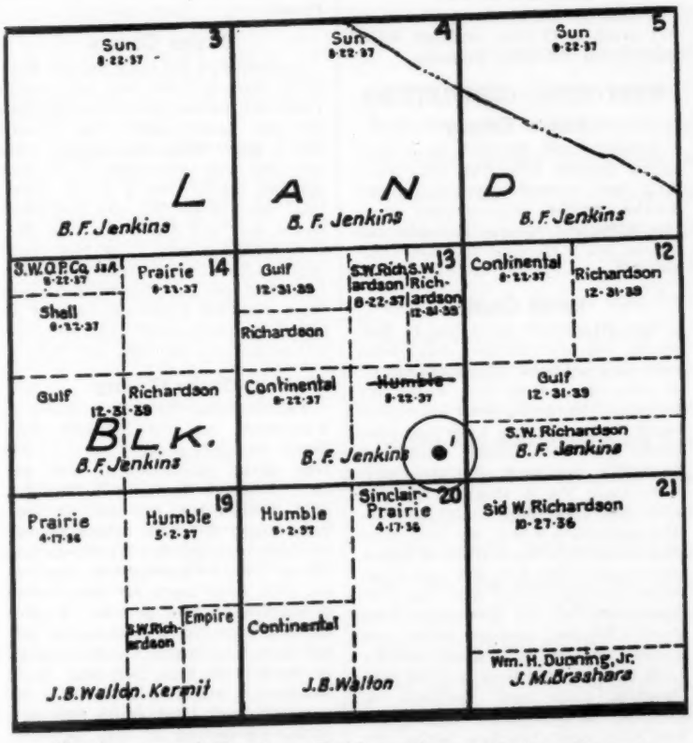
Wahlenmaier and others have staked location in the SE cor. Section 3, Block 26, between production in the Leck and Howe Pools, Winkler County. The Howe Pool is being extended nearly every week as offset wells are completed.

Big Producer Waddell Pool

The Waddell Pool, discovered by Gulf Production Co. in northern Crane County, in 1927, came through with its best producer this week. Magnolia Petroleum Co.'s No. 2 Edwards, SW cor. Section 2, Block B-23, came in flowing at the rate of 7,920 bbls. per day, making 330 bbls. the first hour from lime pay logged at 3,538 feet. The oil tests better than 34 degrees. Gulf Production Co. completed a smaller well, No. 2 Henderson, which gauged 327 bbls. on a five-hour open flow test, with bottom of the hole at 3,525 feet.

Crane County Wildcat

Big Basin Petroleum Co. of San Angelo, formed to drill in West Texas, has staked its first location about 2 miles west of a small producing area in Crane County, southwest of the town of Crane on a block of 2,800 acres, and is to go to 2,500 feet.



Newly opened Keystone Field, northeast Winkler County

Garza County Ordovician

Emerald Oil Co. of San Antonio is planning to drill an Ordovician test in the small shallow producing pool south of Justiceburg in Garza County. The regular pay in the Boren Pool is from 2,500 to 2,600 feet, and the wells make but small pumpers, testing 37 to 38.

Terry County Wildcat

The Yoakum County strike of Davidson and others is no doubt responsible for the report that Danube Oil Corp. of Amarillo will drill on the Brownfield ranch, Section 23, Block T, D.&W.R.R. Survey, on the east side of Terry County and about 36 miles east of the Yoakum County well.

Deep Ordovician

Humble Oil & Refining Co.'s No. 1 Pollock, Ordovician test in Section 4, Block M, E.L.R.R. Survey, northeast Upton County, has slowed up since striking chert but is below 10,965 feet, the second deepest test drilled in the Permian Basin and the third Ordovician test to drill below 10,000 feet.

Gulf Production Co.'s No. 1 Waddell, Section 4, Block B-27, western Crane County Ordovician test, reported to have logged that formation at least 5,000 feet higher than the company's Ordovician test to the east in Upton County, is coring at 6,303 feet.

Howard County Test

Superior Oil Co. is reported planning a test on its wildcat block in the Coahoma neighborhood of eastern Howard County. Tentative location is in Section 34, Block 31, Township 1n, T.&P. Survey, about 3 miles northwest of the town.

Gulf Abandonment

Gulf Production Co. has abandoned a test in the White and Baker area where it brought in a small shallow producer several months ago, but around which several dry holes and a gasser have been completed. Its No. 7 White and Baker, in Section 15, Block Z, T.C. Survey, was given up as a dry hole at a total depth of 1,581 feet. Elevation is 2,526 feet.

There were 14 locations staked in the West Texas district this week with 13 tests completed.

Jones County

Jones and Stasney, consulting geologists and producers of Albany, and Reliance Oil & Royalty Co., are moving in for a test in the SE cor. Section 9, D.&D. lands Survey, on a 3,000-acre block. Magnolia Petroleum Co. and Danciger Oil & Refining Co. hold acreage in the block which is 1 mile west of Avoca in Jones County.

Ranger and Wichita Falls

Big Indian Oil & Development Co., drilling 1 mile northeast of its lone producer in Cooke County, is fishing drill pipe at 3,693 feet on No. 1 J. S. Floyd in Cooke County, having missed the regular pay sand from which the other well is producing, and will probably go to 5,000 feet. It is on a 6,500-acre block.

Sunray Oil Co. and others have started drilling a 4,000-foot test on a 7,500-acre block in the southwest corner of the J. H. White Survey, Cooke County. Sun Oil Co. has been purchasing checkerboarded acreage on a line from this test to the southeast corner of the county.

Humble Oil & Refining Co. is purchasing approximately 2,600 acres in

the Delaware Bend area, centering in the A. Burns Survey, Cooke County, following operations of a shooting crew.

El Capitan Oil Co., subsidiary of Noble Drilling Co. of San Angelo, is to drill five wildcats on as many blocks in Jones, Callahan and Shackelford Counties.

C. W. Clark of Wichita Falls, just returned from a business trip to New York, is to drill 10 more wildcat blocks in the North Central Texas district.

Block in Lampasas County

J. P. Williams and J. S. Pugh of Hamilton are assembling a 10,000-acre block centering in the R. Elliott Survey, 4 miles north of Lampasas in Lampasas County. A test was drilled to 3,008 feet by Roeser and Pendleton of Forth Worth, 2 miles south, but proved dry.

There were 31 locations staked in the Wichita Falls district this week, and 44 tests completed, 24 dry. Production averaged over 65,600 bbls. per day.

Panhandle District

Seven locations were made in the Panhandle district and eight wells completed.

The Railroad Commission placed the proration factor of Panhandle wells at 3.12 per cent of proratable oil, giving the district a daily allowable of 58,800 bbls., with the field potential at 528,074 bbls. per day. The producing countries have the following number of wells and potentials:

	Wells	Potential (Bbls)
Carson	289	23,618
Gray	1,270	230,082
Hutchinson	763	77,952
Moore	1	76
Wheeler	249	196,345

COMPLETIONS IN RANGER (WEST CENTRAL TEXAS)

Brown County

Ragsdale's No. 1 Armstrong, dry and abandoned 1,450 feet. Rhodes' No. 8 Thompson, total depth 1,218 feet, initial production 1 bbl. a day. Cooley and others' No. 2 Sears, total depth 650 feet, initial production 5 bbls.

Callahan County

Beams Producing & Development Co.'s No. 11-D Jackson, total depth 1,194 feet, initial production 120 bbls. Humble Oil & Refining Co.'s No. 2 Williams, total depth 938 feet, shot, initial production 10 bbls. McLean's No. 3 Snyder, total depth 1,170 feet, initial production 3,250,000 feet gas. Odell's No. 1 Bury, dry and abandoned 636 feet. Suits, trustee's No. 1 Woods, total depth 1,572 feet, initial production 20 bbls. Ungren & Frazier's No. 8-C Jackson, total depth 1,210 feet, initial production 25 bbls.

Coleman County

Anzac Oil Corp.'s No. 1-D Morris, dry and abandoned 2,225 feet. Jamison and others' No. 4 Kingsberry, total depth 1,381 feet, initial production 1,000,000 feet gas.

Comanche County

Warren's No. 1 Thomas, dry and abandoned 170 feet.

Shackelford County

Alexander's No. 1 Ohio, total depth 598 feet, initial production 20 bbls. Choate & McCamey and others' No. 4 Simpson and others, dry and abandoned 1,648 feet. Dean & Atkisson's No. 7 Newell, top pay 1,448 feet, total depth 1,464 feet, initial production 168 bbls. Dickey Brothers' No. 5 Walker, dry and abandoned 440 feet. Estes' No. 1 Davis, dry and abandoned 1,275 feet. Hart and others' No. 3 Elliott, dry and abandoned 778 feet. Hoffman & Page's No. 16 Morris and Buie, total depth 1,610 feet, initial production 5 bbls. Hollandsworth's No. 1 Vickers Trustee, dry and abandoned 1,974 feet. Parks and others' No. 1 Turner and others' dry and abandoned 960 feet. Reliance Oil & Royalty Co.'s No. 11 Davis, total depth 1,601 feet, initial production 40 bbls. Rhodes' No. 4 Gray, dry and abandoned 1,670 feet. Roeser & Pendleton's No. 62-A-61 Cook, total depth 1,332 feet, initial production 58 bbls.; No. 63-A-61 Cook, total depth 1,273 feet, initial production 40 bbls.; No. 64-A-61 Cook, dry and abandoned 1,540 feet; No. 65-A-61 Cook, total depth 1,240 feet, initial production 35 bbls.; No. 10 Dawson and others, total depth 1,625 feet, initial production 35 bbls.

Erath County

Joiner and others' No. 1 Patton, dry and abandoned 5,314 feet, elevation 1,285 feet.

Eastland County

States Oil Corp.'s No. 1 Gowan, total depth 2,877 feet, acidized, initial production 160 bbls., pumping.

WEST TEXAS COMPLETIONS

Fisher County

General Crude Oil Co.'s No. 6 Flannagen, top pay 3,085 feet, total depth 3,122 feet, treated twice, initial production 236 bbls. day, pumping, elevation 1,793 feet. George Callahan and others' No. 2 Herring, location abandoned.

Pecos County

Taylor-Link Oil Co.'s No. 16 University, top pay 1,659 feet, total depth 1,665 feet, acidized, initial production 94 bbls. oil and 23 bbls. water day on pump. Marathon Oil Co.'s No. 25 Smith-Taylor, top pay 1,520 feet, total depth 1,670 feet, initial production 3,166 bbls. per hour. Phillips Petroleum Co.'s No. 5 Monroe, top pay 1,330 feet, total depth 1,337 feet, initial production 9 bbls. per hour. Gulf Production Co.'s No. 7 White & Baker, total depth 1,581 feet, dry and abandoned, elevation 2,526 feet. Mack T. Anderson's No. 1 McKenzie, total depth 1,378 feet, acidized, initial production 30 bbls. first hour, top pay 1,338 feet, plugged back to 1,365 feet, elevation 2,731 feet. Cardinal Oil Co.'s No. 32-E Tippett, top pay 590 feet, total depth 608 feet, initial production 108 bbls. oil and 12 bbls. water.

Upton County

Texas Pacific Coal & Oil Co.'s No. 18-A Lane, top pay 1,994 feet, total depth 2,034 feet, acidized, initial production 706 bbls. pumping.

Winkler County

Mid-Continent Petroleum Co.'s No. 4-B Howe, top pay 2,540 feet, total depth 2,993 feet, shot, initial production 756 bbls.

Ward County

Jerry Sines' No. 1 Brown, top pay 2,410 feet, total depth 3,148 feet, shot, initial production 20 bbls. day pumping. California Co.'s No. 10 Gordon, top pay 2,303 feet, total depth 2,525 feet, shot, initial production 733 bbls. Westbrook's No. 3 Shell-Monroe, top pay 2,369 feet, total depth 2,579 feet, shot, initial production 152 bbls. California Co.'s No. 2 Walling & Costley, top pay 2,340 feet, total depth 2,525 feet, shot, initial production 331 bbls.

WICHITA FALLS (North Texas) COMPLETIONS

Archer County

Bridwell Oil Co.'s No. 1 L. F. Wilson estate, total depth 1,564 feet, dry and abandoned. Burns and Long's No. 7 York estate, total depth 1,408½ feet, dry and abandoned. Cal-Tex Oil Co. and G. W. Churchman's No. 1 S. M. J. Benson and others (old well deepened—old total depth 827 feet), total depth 956 feet, dry and abandoned. Cooper Mitchell and others' No. 9 G. B. Hamilton estate, top pay 1,099 feet, total depth 1,115 feet, initial production 10 bbls. per day.

Hamer and Scholl's No. 4 Archer County, total depth 990 feet, dry and abandoned. Petroleum Producers' No. 2 L. F. Wilson, total depth 1,500 feet, dry and abandoned. A. D. Robinson and others' No. 1 A. D. Thompson, total depth 1,650 feet, dry and abandoned. Shappell Oil Co.'s No. 1 Archer County and others, total depth 1,945 feet, dry and abandoned. S. W. Sutherland's No. 1 T. J. Dempsey, total depth 460 feet, dry and abandoned.

Baylor County

Consolidated Oil Co.'s No. 1-U Portwood, top pay 1,411 feet, total depth 1,415 feet, initial production 350 bbls. per day. Dudley-Akin and Raysor's No. 1 Burl Mills, total depth 1,502 feet, dry and abandoned. S. P. Morris and others' No. 1 L. J. Howe, total depth 2,006 feet, dry and abandoned. Ray and Staniforth's No. 26-C Portwood, top pay 1,332 feet, total depth 1,350 feet, initial production 1,250 bbls. per day flowing and swabbing; No. 29-C Portwood, top pay 1,355 feet, total depth 1,362 feet, initial production 408 bbls. per day.

Cooke County

Fain-McGaha Oil Corp.'s No. 1 C. Felderhoff, top pay 709 feet, total depth 850 feet, plugged back to 730 feet, initial production 15 bbls. per day. Hudspeth-Harvey and Bass' No. 3 T. Trubenback, top pay 860 feet, total depth 887 feet, initial production 200 bbls. per day. Hudspeth and others' No. 7 Trubenback, top pay 871 feet, total depth 890 feet, initial production 50 bbls. per day. Merrick Drilling Co.'s No. 7 J. Hess, top pay 865 feet, total depth 882 feet, initial production 25 bbls. per day. A. D. Robinson's No. 3-B J. H. Otto, top pay 819 feet, total depth 840 feet, initial production 20 bbls. per day. Seitz-Comegys-Seitz and others' No. 2 R. W. Trew, top pay 711 feet, total depth 725 feet, initial production 98 bbls. per day. Texas Co.'s No. 4 J. Walterscheid, top pay 748 feet, total depth 771 feet, initial production 20 bbls. per day.

Denton County

Barbara Oil Co.'s No. 1 Mrs. E. Dowdell, total depth 1,802 feet, dry and abandoned. Oil Finance Corp.'s No. 1 J. S. Gamble, total depth 1,010 feet, dry and abandoned. Pearl Crystal and Mid-Continent Drilling Co.'s No. 1 Goldsmith, total depth 1,560 feet, dry and abandoned.

Jack County

C. C. Bloodworth and others' No. 1 D. R. Sewell, top pay 292 feet, total depth 303 feet, initial production 6 bbls. per day. C. C. Bloodworth's No. 2 D. R. Sewell, top pay 286 feet, total depth 292 feet, initial production 12 bbls. per day. G. A. Erickson and others' No. 3 W. E. Hunt, total depth 531 feet, dry and abandoned. Gray Drilling Co.'s No. 8 J. M. Bloodworth, top pay 274 feet, total depth 289 feet, initial production 3 bbls. per day.

Montague County

Benson Brothers and McIntyre's No. 1-A Williams estate, total depth 1,874 feet, junked and abandoned. Benton and Holmes' No. 13-B Davenport, top pay 1,680 feet, total depth 1,700 feet, initial production 70 bbls. per day. Ace Gutowsky and others' No. 1 J. E. Lemmon, total depth 340 feet, dry and abandoned. Lesh and McCall's No. 9-B R. W. Cunningham, top pay 773 feet, total depth 850 feet, initial production 500,000 feet of gas per day.

Throckmorton County

Elliott Bryant's No. 1 R. P. Lee, total depth 510 feet, dry and abandoned.

Wichita County

Carl B. Bailey's No. 30 Munger Brothers, top pay 1,088 feet, total depth 1,091 feet, initial production 3 bbls. per day. Bridwell Oil Co.'s No. 15 Allen and Kemp, top pay 438 feet, total depth 450 feet, initial production 6 bbls. per day; No. 16 Allen and Kemp, total depth 1,781 feet, dry and abandoned. George W. Cooper's No. 5 Waggoner, total depth 1,549 feet, dry and abandoned. Regal Oil Co.'s No. 1 J. A. Fisher, total depth 1,602 feet, dry and abandoned. J. H. Turner and others' No. 1 N. L. Lowrance, total depth 907 feet, dry and abandoned. Waggoner Refining Co.'s No. 7-X Waggoner estate, total depth 2,000 feet, dry and abandoned.

Young County

C. E. Beavers and others' No. 3 Barnett and Gibbs, top pay 645 feet, total depth 650 feet, initial production 35 bbls. per day. L. G. Hawkins and others' No. 1 Lizzie Herring, total depth 1,025 feet, dry and abandoned. L. A. Hedrick and others' No. 1 A. C. Casey, total depth 603 feet, dry and abandoned. Underwood and Campbell's No. 5-C R. Campbell, top pay 877 feet, total depth 895 feet, initial production 100 bbls. per day.

PANHANDLE COMPLETIONS

Gray County

Dixon Creek Oil & Refining Co.'s No. 8 Archer, top pay 3,170 feet, total depth 3,260 feet, shot, initial production 646 bbls. pumping. Plains Holding Co.'s No. 3 Chapman, top pay 2,640 feet, total depth 2,690 feet, initial production 455 bbls. pumping. Texas Co.'s No. 8 Harrah, top pay 3,153 feet, total depth 3,258 feet, shot, initial production 319 bbls. pumping.

Hutchinson County

Huber Petroleum Co.'s No. 3-A "C" Johnson, top pay 3,090 feet, total depth 3,095 feet, initial production 749 bbls. pumping. International Petroleum Co.'s No. 3 Lewis-Badger, top pay 2,855 feet, total depth 2,981 feet, shot twice, initial production 597 bbls. pumping. Owl Oil Co.'s No. 1 Moore, top pay 3,024 feet, total depth 3,061 feet, shot, initial production 523 bbls. pumping. Travelers Oil Co.'s No. 1-B Haile, top pay 3,032 feet, total depth 3,060 feet, shot, initial production 20 bbls.

Moore County

Anderson & Kerr's Petroleum Co.'s No. 1-G McDowell, total depth 3,477 feet, plugged back 3,420 feet, initial production 19,600,000 feet gas.

Overproduction Is Reduced Below 35,000 Barrels Daily

By L. E. BREDBERG

DALLAS, Tex., Nov. 4.—Three wildcat locations were staked in the East Texas district this week and one dry wildcat completed. The new wildcats are to be drilled in Gregg, Hill and Lamar Counties. The Gregg County test is to be west of the East Texas Field in the southwest corner of the county. C. L. Port is to drill this test on the Mrs. F. G. Glover lands in the George Melton Survey. The Hill County test is an extreme wildcat on the J. H. Atchison estates in the E. Carroll Survey, 5 miles west of Hillsboro. Humble Oil & Refining Co. was the last to drill in this county, abandoning a dry hole on the eastern side several months ago. The Lamar County test is to be drilled by Bruce Brothers on the Charles Price farm in the William Nelson Survey, about 10 miles northeast of Paris and 1 mile west of Trout.

The wildcat failure was Hoover and others' No. 1 McFall, in the Garrison Survey, 4 miles southeast of Wortham in Freestone County. It was dry at a total depth of 3,612 feet. Elevation is 451 feet.

Long Lake Field

Another oil producer has been completed in the north extension area of the Long Lake Field, southwest Anderson County. Tide Water Oil Co. and Texas Seaboard Oil Co. completed No. 2 Shaw and Cern flowing 129 bbls. through a one-eighth inch choke on a 24-hour gauge. It is about 1,100 feet northwest of No. 1, extending the field that distance north.

Standard Oil Co. of Kansas will be the first company to drill within the jointly owned Tide Water Oil Co. and Texas Seaboard Oil Co. block in the Long Lake area. It is moving in material on the Robinson and Hombs farm in the John Adams Survey, south of No. 1 Shaw and Cern. If this test makes a producer Stanolind Oil & Gas Co. will be forced to drill a south offset. F. H. E. Oil Co. of Fort Worth is reported planning a test on the Palestine Airport northeast of production, just north of Tucker and within the Tide Water and Texas Seaboard block. If the tests on this land prove producers they will force offsets on all sides by those companies.

Landowners in the Long Lake area of southwest Anderson County have requested the recent 640-acre gas allocation factor in that field be reduced so operators with smaller tracts will be given an incentive to drill their tracts. Tide Water Oil Co. and Texas Seaboard hold 75 per cent of the acreage and are extending their operations cautiously. The companies insisted in the hearing at Austin that it was primarily a gas field, but with oil producers being completed on the north end it begins to appear as if an oil field of proportions would be developed, especially in that area. It is believed the Railroad Commission would issue an order with a smaller acreage factor, or delay proration of the gas on an acreage basis until further study can be made of the situation. Operators are now feeling an oil field exists in the area whereas before it looked principally as a gas area.

Locations in Rains County

Allen and McClung have made locations for three wildcats in Rains County, with workmen rigging up on two, No. 1 Bullard in the Nancy Brantley Survey and No. 1 Giles in the Cunningham Survey, about 6 miles southwest of Emory.

East Texas Field

Gulf Production Co. and Humble Oil & Refining Co. are soon to start experimental work on salt water disposal in an input well on the west side of the East Texas Field in Smith County. Sun Oil Co. abandoned the test to be used when it got a salty hole.

At present there are only a few over 1,000 wells making salt water, from one-half of 1 per cent to 90 per cent.

New Potential Tests

The Railroad Commission field engineers have been ordered to make new potential tests on key wells to be decided upon this week. Forty-four potential tests were made last month on key wells, but the potential contour map constructed from these tests was rejected by the commission. Dry wells outside the border of the field were used to form the zero contour line. J. E. Bailey, engineer of the commission in the Kilgore office, will be in charge.

Overproduction

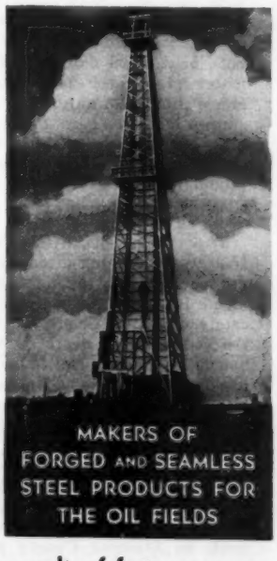
Little attention is being paid to overproduction as it has fallen below the 35,000-bbl. per day mark with a large part from confiscated oil. Runs to local refineries are below 55,500 bbls. per day.

There were 66 tests completed in the field this week, one dry, six pumpers, three swabbing and one gas well. The dry hole was drilled by Humble Oil & Refining Co. on the Castleberry lands in Gregg County. It topped the Georgetown lime at 3,465 feet and was given up at 3,532 feet. Locations and completions are running around 50 to 60 per week each with smaller operators drilling most of the wells.

Y. P. F. London Office

The General Direction of Yacimientos Petroliferos Fiscales, Argentine Republic, has established in London a technical and commercial commission which will be in charge of the study and purchase of all the necessary materials for the oil industry, for the Argentine Government Oilfields, their storage plants and refineries and for the transport and marketing of the by-products they manufacture. The offices are at Bush House, Aldwych, London, telephone number Temple Bar 9091, under the name of Yacimientos Petroliferos Fiscales Argentinos—Technical and Commercial Commission.

The successful steel plant always adds "plus" to the word "manufacture". Today as always Harrisburg is engaged in manufacturing, plus an engineering and metallurgical supervision which combine for the production of products from the viewpoint of the purchaser . . . . As a result every operation is Harrisburg-controlled. Every product is Harrisburg designed . . . . While it was superiority of design that first won distinction for Harrisburg seamless and forged steel products, their quality also rests in a very definite way on the fact that Harrisburg makes its own steel. Consequently: the steel that goes in each product is virtually custom-made; the metal of each product has the analysis and physicals which years of testing have proven best suited for the purpose . . . . If you are interested in quality products that will cut costs, if you are considering the purchase of seamless or forged steel products that are the result of forty years experience in manufacturing for the petroleum industry, consult Harrisburg. Harrisburg oil-field products: drop-forged pipe flanges (available with electro-galvanized threads); seamless steel pipe couplings, pump liners, and bull plugs; tool joint, casing and drive shoe forgings; alloy and carbon steels. Immediate delivery can be made from distributors' stocks.



HARRISBURG STEEL CORPORATION, Harrisburg Pa.

Southwest Texas District

DEVELOPMENT IN FAULT LINE ZONE SHARES THE SPOTLIGHT

By GEORGE WEBER

SAN ANTONIO, Tex., Nov. 4.—Completion of two wells in the new Southwest Darst Creek Field, Guadalupe County, together with developments throughout the Fault Line zone obtained for that area a share in the attention of Southwest Texas operators this week. Effect of the previous week's discoveries was evident from increased activity in Nueces and Goliad Counties and Lopez Pool in Webb County. Increasing interest in Live Oak County has brought that county to the fore in wildcat play.

Evidence of varied opinion greeted the announcement late in the week of the two new Guadalupe County wells, J. E. Clark's No. 1 Lay and Kniffin & Gallagher's No. 1 Larison. Both wells are in the Davis Survey southwest of the Darst Creek, in territory proven by Clark's No. 1 Lay several weeks ago. No. 1 Larison is bottomed at 2,473 feet in the Eagleford, and No. 1 Lay is in the Austin chalk at 2,429 feet. Both wells were at first reported to be capable of 300 bbls. production daily, but later estimates placed the latter well at a much higher figure. No accurate gauges have yet been taken, and the ultimate value of wells in this area cannot be determined by their initial production.

Fault Line Zone

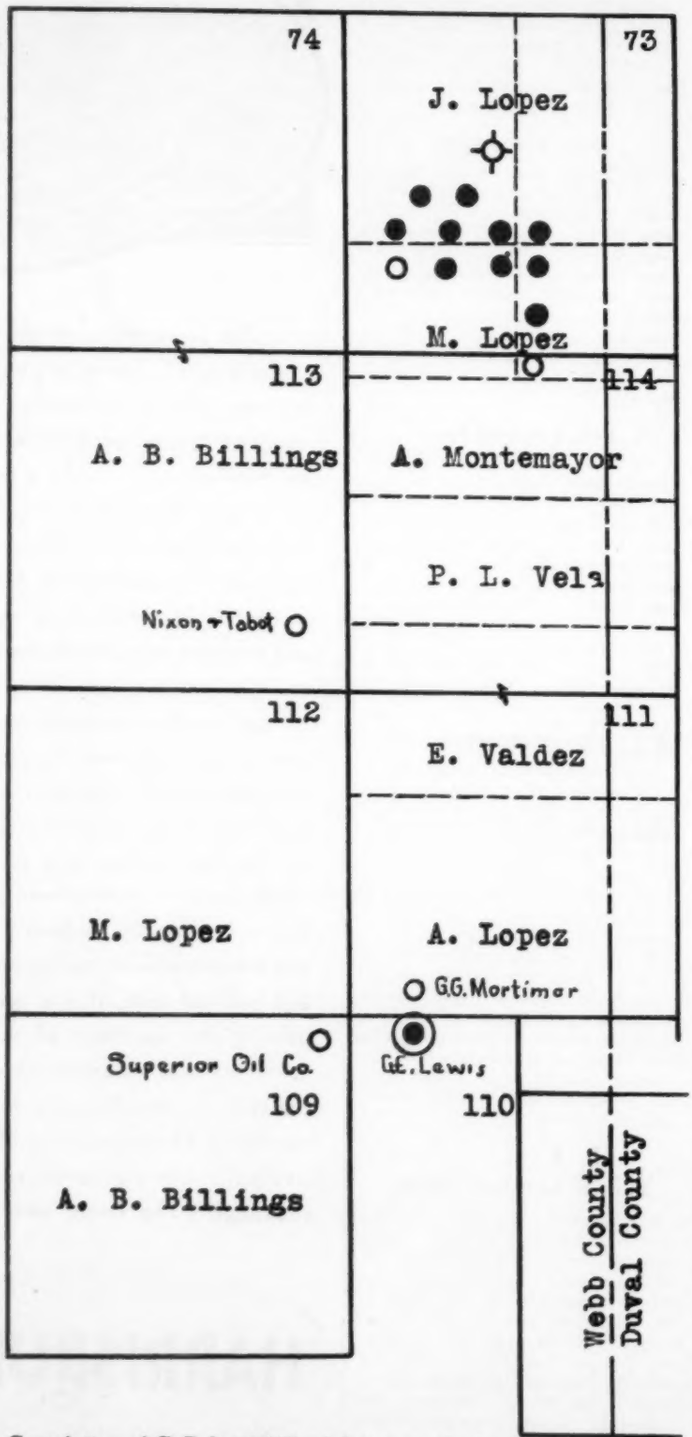
Two other wells in the Fault Line zone were claiming attention as they approached the testing stage. Diamond Halff Oil Co.'s No. 1 Eardley estate, Dimmitt County wildcat, has reached contract depth of 4,250 feet and is shut down awaiting results of a Schlumberger survey. Good showings in this test point either to its completion as a producer or the drilling of another test. In Gonzales County, Inter-Allied Petroleum Co.'s No. 1 Wells topped the chalk at 3,722 feet and was drilling at 3,805 feet.

A new test got under way this week in Atascosa County as R. C. Lee's No. 1 Atascosa Trust spudded in about 3 miles north of Poteet. Plateau Oil Co.'s No. 1 Garrison, wildcat in Bandera County, reported softening of shale as the test continued below 4,750 feet.

In Frio County, Midland Oil Co.'s No. 1 Halff & Oppenheimer, 1 mile north of the Pearsall Field, was abandoned at 4,005 feet without having encountered any good showings.

Nueces County

The new producing field in Nueces County was realized this week by completion of J. K. Coulton's No. 1 Baldwin. The well which made a big showing the previous week on a drill stem test was brought in as a gasser, jetting 35 to 80 bbls. of oil together with 1,000,000 feet of gas per day, on a five-thirty-seconds inch choke. Casing pressure was recorded at 1,650 pounds. The top of the sand was cored at 4,078 feet and 4 feet were taken in the well. The discovery shows the presence of a definite structure, and production from the Saxet horizon is also anticipated. The well is 3 miles east of production in the Saxet Field, and 1½ miles west of Corpus Christi.



Completion of C. F. Lewis' No. 1 Lopez marked a 2-mile southward extension to the Lopez Pool. Shown also are tentative offsetting locations by G. G. Mortimer and Superior Oil Co., and Nixon & Tabots No. 1 Billings drilling in Section 113 half way between the well and the Lopez Field proper

In western Nueces County near the Agua Dulce Field, LaJite Corp.'s No. 1 King, the wildcat which last week flowed oil and drilling fluid from perforations at 5,140-55 feet, was plugged back to 4,012 feet and again perforated at 3,983-90 feet. Screen and liner were being run.

Three new locations and two completions were made in the Saxet Field of the same county during the week. Shell Petroleum Corp.'s No. 1 Flato was brought in flowing 23.5 bbls. per hour on a five-sixteenths inch choke, and Southern Minerals' No. 2-B Walton was gauged at 336 bbls. per day on the same size choke. Southern Minerals Corp. made two additional locations, No. 1-A Isensee and No. 3 Sally Page. Republic Natural Gas Co. is rigging up on No. 11 Dunn location, one location south of No. 10.

After completion of No. 1-C Kaufman, first large Conroe sand producer in Southwest Texas, Brown and Wheeler are moving back on No. 1 Kaufman to deepen it. A later gauge on the recent discovery showed 456 bbls. per day on a one-quarter inch choke.

Live Oak

Two wildcat wells in Live Oak County were coring for the Pettus sand at the end of the week. Earl Calloway's No. 1 Lyne which topped the Jackson high at 2,477 feet and tested salt water in the Hockley sand at 2,949-62 feet, was coring hard rock at 3,470 feet. Conway and Buescher were coring at 2,986 feet expecting the Pettus shortly. One other test spudded in, Trinity Drillers' No. 1 McNeill, and four more were awaiting materials to begin tests.

Bee County

The Ray Field in Bee County received extensions in two directions during the week. Duncan and others' No. 1 Campbell was brought in for 38 bbls. per hour on a one-quarter inch choke to extend the production northwest, and Woods & Young's No. 1 Ray, a southwest outpost well, was completed for 28 bbls. per hour through open tubing. The Dirks Field gained three new producers in Texas Co.'s No. 10 Young, Mills Bennett Production Co.'s No. 4 Rapp and Heyser Heard and Walton's No. 11 Young.

Seven Sisters

The Seven Sisters Field, northern Duval County, was defined on the northwest by Humble Oil & Refining Co.'s No. 1 Badgley, plugged and abandoned in the southeast corner of

Survey 307. Meanwhile, an eastern outpost, Daube & Westheimer, spudded in, and Shell Petroleum Corp.'s No. 1 Wood-Welder and T. P. Morgan's No. 1 Welder, southern outposts, located in Surveys 385 and 591, respectively, were due to get under way shortly. On the western edge, Humble Oil & Refining Co. made location for No. 3 T. D. Smith in Survey 382.

Duval County

Duval County continued to lead in number of completions and new locations. Three wells were abandoned also, two in proven areas and one wildcat.

Loma Novia, the most active field in Southwest Texas, added seven wells to its production. The field was defined at one point on the east by abandonment of Sun Oil Co.'s No. 1 Hubbard, in the northwest corner of the Sun lease in Survey 84. The sand cored at 2,870-80 feet tested dry. New producers included: Rodney DeLange's No. 1 Duvon in Survey 76, making 7 bbls. per hour through open tubing at 2,751 feet; Hamill Smith and Ogden's No. 2 Hahl in Survey 78, completed for 30 bbls. per hour at 2,644 feet; same company's No. 11 Hubbard, in Survey 77, brought in for 23 bbls. per hour at 2,640 feet; Highland Oil Co.'s No. 3 Hubbard, Survey 75, completed for 150 bbls. per day from sand at 2,572 feet; Magnolia Petroleum Co.'s No. 9 Hahl, making 30 bbls. per hour through a one-half inch choke in Survey 67; Steiren Oil Co.'s No. 8 Wright, an average well producing from sand at 2,684-97 feet in Survey 72; and Texas Co.'s No. 10 Wendt, an 816-bbl. well bottomed at 2,671 feet, located in Survey 68.

New locations, numbering 10, exceeded the number of completions as usual, showing a continuing upward trend.

Webb County

Webb County had its share of the activity in the Laredo district, with interest centering in the Lopez Pool. The completion of Lewis' No. 1 Lopez recently as a 2-mile southward extension was followed by three locations in its immediate area. Superior Oil Co.'s No. 1 Billings is drilling below 500 feet. In the field proper, to the north, three locations were announced and one completion, Mills Bennett Production Co.'s No. 2 M. Lopez, making 296 bbls. per day on a one-half inch choke with total depth 2,216 feet. In the O'Hern Field, Magnolia Petroleum Co. completed No. 17 Brennan-Benavides for 175 bbls. per day and Texas Co. brought in No. 6 Brennan-Benavides for 288 bbls.

Samfordyce

In the lower Rio Grande Valley, the Samfordyce Field was defined on the west by abandonment of Porter & Pickens' No. 1-B Garcia. At the same time, a large producer was completed by Phillips and Barnsdall in No. 2 Yturria Land & Livestock Co., which made 55 bbls. per hour on a five-eighths inch choke. Offset locations were made on both the Porter and Phillips tests. The Hidalgo County wildcat, Sloan's No. 1 Brock & Showers, after testing salt water in a lower sand, has been plugged back and will be perforated at 4,640-59 feet in another attempt at production.

Starr County

T. K. Irwin's No. 1 S.C.C.C. test south of the Barbacoas Field in Starr County encountered a very good showing in coring the sidetracked hole at 2,648-50 feet. Casing is being set and a test will be made early in the week. In the Mercedes Pool, eastern Hidalgo County, Union Sulphur's No. 5 American Rio Grande, after making about 85 bbls. per day of fluid, 50 per cent oil and 50 per cent salt water, was killed and the hole plugged back to 7,400 feet, where it will be sidetracked. The company's No. 4 well is drilling at 6,700 feet and will approach the producing horizon in a few days.

Crude Oil Stocks

Stocks of domestic and foreign crude petroleum at the close of the week ending October 26 totaled 300,990,000 bbls., according to the Bureau of Mines, a decline of 1,659,000 bbls., comprising a decrease of 1,374,000 bbls. in stocks of domestic crude and a decrease of 285,000 bbls. in stocks of foreign crude. Both crude oil production and runs to stills increased but imports declined materially. Daily average crude production was approximately 2,845,000 bbls. or 10,000 bbls. above the average of the previous week. Daily average imports of crude decreased from 115,000 bbls. to 57,000 bbls. Daily average crude runs to stills were 2,775,000 bbls. or about 50,000 bbls. above the level of the previous week. Daily average balance was (barrels): Production, 2,845,000; imports, 57,000; decrease in stocks, 237,000, equals runs to stills, 2,775,000; exports, fuel and losses, 364,000.

WEST TEXAS WILDCATS

Week Ending November 2

Andrews County

L. G. Stogner et al's No. 1 Mrs. C. George, 660 ft. from S and E, Sec. 25, Blk. A-22, P.S.L. Sur.
S.D. 5,110 ft.

Brewster County

C. Dodson's No. 1 Texas American Syndicate, 660 ft. from N and E, Sec. 66, Blk. 10, G.H.&S.A. Sur.
T.D. 1,715 ft.; R.U. on new location.
Joiner et al's No. 1 McIntyre, 353 ft. from S, 2,290 ft. from E of Sec. 21, Blk. 352, W. M. Mitchell Sur.
S.D. 2,150 ft.
King & Franklin's No. 1 Gage Est., C Sec. 138, Blk. 22, G.H.&S.A. Sur.
Elev. 4,244 ft.; S.D. 1,605 ft.
O. H. Storey's No. 1 Wilson, 1,980 ft. from N and E lines of Sec. 3, Blk. 212, T.&St.L. Sur.
Elev. 3,609 ft.; S.D. 1,875 ft.

Cochran County

Humble Oil & Ref. Co.'s No. 1 C. D Slaughter, 5,600 ft. from S and 6,000 ft.

Rodessa Allowable Reduced to 600 Bbls. Daily Per Well

By J. R. CRUMPTON

SHREVEPORT, La., Nov. 4.—Interest in the Rodessa area is centered on Vaughn's No. 1 Comegys on the northern flank in which plug is being drilled. There was only one completion in that district last week, United Gas Co.'s No. 1 Rodessa Oil and Land, flowing 85 bbls. an hour through one-half inch choke at 6,003 feet.

Two good wells were completed in the Converse Field, Sabine Parish, after acid treatment.

Daily allowable in the Rodessa Field has been cut to 600 bbls. per well, it was announced by Dr. J. A. Shaw, head of the state minerals department.

With 12 wells already producing allowable was fixed for November at 7,200 bbls. per day. This is a 400-bbl. decrease from October.

Production of the Rodessa Field to date has totaled 516,466 bbls., it was reported Friday. Of the total, 211,655 bbls. have been produced since October 10, last previous report, the flow before that aggregating 304,811 bbls.

Two deep tests, one in Sligo Field by the Triangle Drilling Co., and one in Sugar Creek by the United Gas Co., are creating interest.

Crude Production

Estimated daily average crude oil production for the week ending November 2 follows:

NORTH LOUISIANA

	Bbls.
Bellevue	540
Caddo light	4,435
Caddo heavy	2,365
Converse	1,380
Cotton Valley	390
DeSoto and Red River	1,405
Elm Grove	375
Haynesville	8,395
Holly	150
Homer	2,615
Pleasant Hill	175
Rodessa	11,155
Sarepta-Carterville	480
Urania	2,790
Zwolle	1,370
Total	33,020

SOUTH ARKANSAS

Champagnolle	1,930
El Dorado	2,265
Lisbon	320
Miller County	1,385
Nevada	865
Smackover light	2,280
Smackover heavy	17,810
Stephens	620
Urbana	2,380
Total	29,855

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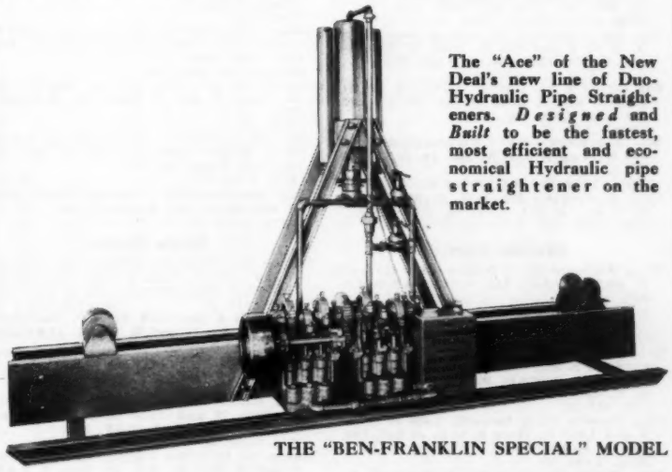

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from E lines of League 135, Armstrong County School Lands
T.D. 3,958 ft.; to set csg.

Coke County

Haggerty et al's No. 1 Gaston, 340 ft. from S and 454 ft. from W, Sec. 11, Jos. Young Sur.
S.D. 3,250 ft.

Concho County

Maverick Oil Co.'s No. 1 Jim Rice, 330 ft. from S and W lines of NW¼ of Sec. 18, S.N. Ry. Sur.
S.D. 150 ft.

John W. Westbrook's No. 1 Ledbetter, 1,950 ft. from N and 3,300 ft. from E lines of Sec. 2, Sur. No. 1,673.
S.D. 600 ft.

Crane County

Gulf Prod. Co.'s No. 1 Waddell, C NW NW Sec. 4, Blk. B-27, P.S.L. Sur.
T.D. 6,203 ft.; reaming hole.

Wahlenmaier Pet. Corp.'s No. 2 Kloh, 330 ft. from S and W. Sec. 33, Blk. 44, Twp. 3s, T.&P. Sur.
Drlg. 1,967 ft.

Crockett County

Leslie-Hiller et al's No. 1 Todd, 1,300 ft. N and 330 ft. E, Sec. 36, Blk. WX, G.C.&S.F. Sur.
S.D. 521 ft.

John I. Moore's No. 1 A. C. Hoover, 330 ft. from S and E lines of Sec. 4, Blk. FF H.&B. Sur.
Spudded and shut down.

Culberson County

Anderson-Prichard Oil Corp., Magnolia Pet. Co. et al's No. 1 Borders, 1,255 ft. N and 2,305 ft. from W, Sec. 34, Blk. 69, P.S.L. Sur.
Drlg. 2,526 ft.

Dawson County

Adams & Turner's No. 1 John Robinson, 1,320 ft. from N line, 1,320 ft. from W line of Sec. 46, Blk. M, E.L.&R.R. Sur.
S.D. 4,860 ft.

Ector County

W. P. Dunning, Jr., et al's No. 1 Mrs. Clarence Scharbauer, 440 ft. from S and 2,200 ft. from W lines of Sec. 33, Blk. 44, Twp. 1n, T.&P. Sur.
Recmtd. csg. 1,605 ft.

Gulf Prod. Co.'s No. 3 Goldsmith, 440 ft. from S and E, Sec. 22, Blk. 44, Twp. 1s, T.&P. Sur.
Drlg. 3,605 ft.

Gulf Prod. Co.'s No. 2 Goldsmith, 2,300 ft. from N and 440 ft. from E lines of Sec. 15, Blk. 44, Twp. 1s, T.&P. Sur
Drlg. 3,761 ft.; 40,000,000 ft. gas 3,745 ft.

Empire G. & F. Co.'s No. 2 Wight, 440 ft. from N and W, Sec. 2, Blk. 43, Twp. 1s, T.&P. Sur.
Drlg. 4,250 ft.; well flowing.

Sinclair Prairie Oil Co.'s No. 2 Wight, 2,200 ft. from N and 440 ft. from E, Sec. 10, Blk. 43, Twp. 1s, T.&P. Sur.
Drlg. 3,643 ft.

Sun and Atlantic's No. 1 O. B. Holt, 1,980 ft. from S and 660 ft. from W lines of Sec. 4, Blk. 43, Twp. 1n, T.&P. Sur.
S.D. 4,050 ft.; standardizing.

Sun Oil Co.'s No. 1 W. P. Edwards, 466 ft. from N and E lines of Sec. 29, Blk. 43, Twp. 3s, T.&P. Sur.
Drlg. 3,111 ft.

Ray Westbrook's No. 1 Yarbrough & Allen, 440 ft. from N and W, Sec. 26, Blk. B-14, P.S.L. Sur.
Elev. 2,824 ft.; S.D. 4,004 ft.

York & Harper's No. 1 H. C. Foster, 660 ft. S and E Sec. 13-43-2s, T.&P. Sur.
T.D. 1,365 ft.; U.R. csg.

Edwards County

O. L. Williams' No. 1 Holman, 300 ft. from N and E, Sec. 145, C.C.S.D.&R.G.N.G. Sur.
S.D. 1,000 ft.

Fisher County

L. A. Daniels et al's No. 1 J. J. Nicklees, 1,700 ft. S and 2,070 ft. W of SW cor. of Sec. 60, H.T.&B. Sur., but in Sub. 1, G. W. Lawrence Sur., 6 miles E of Roby.
S.D. 530 ft.

Tide Water's No. 2 Howard, 1,620 ft. from N and 1,550 ft. from E lines of Sec. 186, Blk. 2, H.&T.C. Sur.
Drlg. 2,906 ft.

Tide Water Oil Co.'s No. 1 Newman, 1,-788 ft. from N and 1,054 ft. from W of NE¼ Sec. 2½, John Rodman Sur., 4 miles SE of Roby.
Drlg. 3,182 ft.

Gaines County

Stogner's No. 1 Kirk, SW¼ Sec. 28, Blk. A-21, 8 miles S of Seminole.
Location.

Wahlenmaier Pet. Co. et al's No. 1 E. H. Jones, 660 ft. S and W, Sec. 414, Blk. G, C.C.S.D.&R.G.N.G. Sur., 23 miles NW of Seminole.
S.D. 92 ft.; moved in rotary.

W. T. Walsh et al's No. 1 Averitt, 330 ft. N and E lines, Sec. 228, Blk. G, W.T.R.R. Sur.
Elev. 3,322 ft.; gas show 3,765 ft.; increase 2,795 ft.; T.D. 2,818 ft.; to set pipe.

Garza County

Dobbs Oil Co.'s No. 1 W. E. Connell, 330 ft. from SW of NW ¼ Sec. 75, Blk. 5, G.H.&H. Sur.
Drlg. 2,727 ft.

Glasscock County

John L. Moore et al's No. 1 J. S. McDowell, 1,980 ft. from N line and 660 ft. from E line of Sec. 22, Blk. 34, Twp. 2s, T.&P. Sur.
Topped lime 9,471 ft.; show oil and gas 9,484-9,520 ft.; increase oil 9,594-9,600 ft. and 9,632-55 ft.; T.D. 10,116 ft.; made 150-bbl. flow when opened on test.

Howard County

T. F. Coal & Oil Co.'s No. 1 Douthit, 400 ft. from S and 2,310 ft. from W, Sec. 116, Blk. 29, W.&N.W. Sur.
Drlg. 1,112 ft.

John I. Moore et al's No. 1 Snyder, 330 ft. from S and W, Sec. 28, Blk. 30, Twp. 1s, T.&P. Sur.
Elev. 2,302 ft.; T.D. 3,010 ft.; pumping 12 bbls. oil per day.

Jeff Davis County

C. M. Joiner's No. 1 Jones & Coffield, 770 ft. from N and 1,322 ft. from E, Sec. 8, Blk. 2, H.&T.C. Sur.
S.D. 1,610 ft.

Jones County

Campbell et al's No. 1 Rowell, in E half of W half, Sec. 6, T.&P. Sur.
S.D. 2,529 ft.

Conway & Gholson's No. 1 Cauthen, 150 ft. from S and W lines of Sec. 24, G. A. Williams Sur.
Drlg. 1,759 ft.

D'Arman & Shelton's No. 1 J. H. Huffaker, 150 ft. from S and 2,490 ft. from E lines of Sec. 25, D.&D.A. Sur.
Dry and abd. 2,200 ft.

J. N. Cooper's No. 1 W. E. Robinson, 660 ft. from S and E, Blk. 7, L. Matthews Sur.
Location.

R. L. Crawford et al's No. 2 Waltzer, 200 ft. from S and 532 ft. from W, Sec. 1, Blk. 2, T.&N.O. Sur.
T.D. 1,720 ft.; C.O.

Farris & Fikes' No. 3 Jennings, 220 ft. from S and W of NE of SE¼, Sec. 207, B.B.&C. Sur.
Machine rigged up.

Farris & Fikes' No. 1-A Jennings, 1,980 ft. from S and 150 ft. from W, Sec. 1, I.&G.N. Sur.
Machine.

Golden Pet. Co. and Cochran's No. 1 J. J. Steele, 150 ft. from N and W, Sub. 7, R. Grimes Sur. No. 8.
Rigged up.

Herring & Hodges' No. 1 Mrs. C. D. Cowsart, 200 ft. from N and W, Sec. 42, Orphan Asylum Lands.
Spudded and S.D.

Humphrey-Guiberson Oil Corp.'s No. 1 Jennings, 220 ft. from N and 2,420 ft. from W, Sec. 207, B.B.B.&C. Sur.
Drlg. 1,650 ft.

Humphrey-Guiberson Oil Corp.'s No. 1 Swenson, 220 ft. from N and 1,540 ft. from W, Sec. 1, I.&G.N. Sur.
Drlg. 1,639 ft.

Tom D. Medders et al's No. 1 J. E. Manley, 1,170 ft. from S and E lines of Sec. 35, Blk. 14, T.&P. Sur.
Drlg. 1,510 ft.

Reliance Oil Co.'s No. 1 Crow, 660 ft. from S and 1,320 ft. from E lines of Sec. 9, D.&D.A. Sur.
Location.

Sandy Ridge Oil Co.'s No. 3 Jones, 1,530 ft. from N and 660 ft. from W, Sec. 6, Blk. 15, T.&P. Sur.
Rigged up machine.

Sanders et al's No. 1 J. A. Martin, 220 ft. from S and E, Sec. 205, B.B.B.&C. Sur.
S.D. 75 ft.

Shaheen et al's No. 1 J. J. Steele, 660 ft. from S and 1,980 ft. from E, Sec. 11, Blk. 15, T.&P. Sur.
S.D. 1,060 ft.

T. K. Simmons' No. 1 Beatty, 220 ft. from S and E of Sec. 4, O.A.L. Sur.
Drlg. 1,313 ft.

Kimble County

Forrest Dev. Co.'s No. 1 Stopp, 660 ft. from N and 1,866 ft. from W, Sec. 682, Blk. N, G.H.&S.A. Sur., 18 miles SE of Junction.
Drlg. 412 ft.

Wilcox Oil & Gas Co.'s No. 1 J. Patterson, 300 ft. from N and E, Sec. 1, D.&P.R.R. Sur.
Show oil 3,677-82 ft.; drlg. 4,752 ft.

Loving County

D. C. Evans' No. 1 W. D. Johnson, 1,310 ft. from N and 1,650 ft. from W, Sec. 13, Blk. 57, Twp. 1, T.&P. Sur.
S.D. 2,555 ft.

Mason Oil Co.'s No. 1 Kyle, 1,980 ft. from S and E, Sec. 12, Blk. 55, Twp. 1, T.&P Sur.
Top Delaware lime 3,912 ft.; top Delaware sand 3,946 ft.; S.D. 4,015 ft.

Martin County

Harris & Meyers' No. 1 L. T. Brook.
S.D. 135 ft.

William Hix' No. 1 O. B. Holt, C of Labor 12, League 319, Garza County School Lands.
Spudded and shut down.

Wright & Scott's No. 1 Flannigan, 330 ft N and E, Sec. 22, Blk. 37, Twp. 1s, T.&P. Sur.
S.D. 100 ft. for casing.

McCulloch County

Mark Hill's No. 1 Moore Bros., 934 ft. from S and 150 ft. from E lines of Sec. 2, State School Land Sur.
T.D. 690 ft.; P.B. to 605 ft.

Poulter et al's No. 2 Wyres, 50 ft. from S and 160 ft. from W, P. W. Rocins Sur
S.D. 1,542 ft.

Mitchell County

Lockhart et al's No. 1 W. C. Berry, 330 ft. from N and 2,310 ft. from E, Sec. 54, Blk. 97, H.&T.C. Sur.
Drlg. 1,631 ft.

Sawtell & Grueber's No. 1 Morrison.
T.D. 2,510 ft.; P.B. to 2,500 ft.; acidized; pumped 60 bbls. fluid, 15% wtr.; 24 hrs.

Southern Union Prod. Co.'s No. 1 Castin, 330 ft. from S and E, Sec. 11, Blk. 28, 1s, T.&P. Sur.
Material.

Nolan County

Harris et al's No. 1 Georgia Institute of Technology, 330 ft. from S and 1,320 ft. from W, Sec. 89, Blk. 34, T.&P. Sur.
S.D. 200 ft.

Pecos County

Ajax Drlg. Co.'s No. 1 University, 2,310 ft. from S and W, Sec. 13, Blk. 18.
Cellar.

Gulf Prod. Co.'s No. 7 White & Baker, 330 ft. from N and E, Sec. 15, Blk. Z, T.C.Ry Sur.
S.D. 1,581 ft.

C. R. Richards' No. 4 Courtney, 920 ft. from N and W, Sec. 78, Blk. OW, 360 ft. S of No. 2.
Elev. 2,967 ft.; drlg. 1,139 ft.

Tex-Mex Pet. Co.'s No. 1 Phillips-Brandenburg, 330 ft. from S and E of N half Sec. 42, Blk. 8, H.&G.N. Sur.
Drlg. 1,265 ft.

Trans-Pecos Oil Co.'s No. 1 F. W. Popham, 1,650 ft. from S and E, Sec. 235, Blk. 11, G.H.&S.A. Sur.
Material.

Trans-Tex. Oil Co.'s No. 1 Caldwell, 330 ft. from E line and 330 ft. from S line of Sec. 27, Blk. 40, Twp. 9, T.&P. Sur.
S.O. 3,905-4,000 ft.; 1 bailer oil in 48 hrs.; drlg. 4,400 ft.

Reagan County

Bahan & Rhodes' No. 1 Reed, 1,320 ft. from N and W, Sec. 31, Blk. 35, Twp. 5s, T.&P. Sur.
Drlg. 530 ft.

Dobbs Oil Co.'s No. 2 Friend, 660 ft. from W and 1,375 ft. from S, Sec. 3, Wm. Allen Sur.
Location.

Skelly Oil Co.'s No. 6 Grayson, 1,320 ft. from N and 440 ft. from W, Sec. 32, Blk. 8, University Lands.
Fishing 365 ft.

Sun Oil Co.'s No. 1 L. W. Young, Sec. 1, G.C.&S.F. Sur., Abst. 170.
S.O. 2,335-90 ft.; top lime 2,340 ft.; to deepen from 2,444 ft.

Reeves County

Dunigan's No. 1 Davis, 330 ft. from N and W, Sec. 7, Blk. 58, P.S.L. Sur.
Location.

Grisham-Hunter Corp.'s No. 1 T. P. Land Trust, 1,320 ft. from S and W lines, Sec. 27, Blk. 57, Twp. 2, T.&P. Sur.
Elev. 3,020 ft.; T.D. 1,900 ft.; set csg.

K. Slack et al's No. 1 Reeves, C NW ¼ Sec. 20, Blk. 56, P.S.L. Sur., 22 mi. N of Toyah.
Top lime 2,680 ft.; T.D. 3,206 ft.; testing wtr. shut off.

Washington Oil Co.'s No. 1 J. M. Radford Grocery Co., 2,640 ft. from S and 340 ft. from E, Sec. 39, Blk. 56, P.S.L. Sur.
Elev. 3,169 ft.; T.D. 502 ft.

Runnels County

John Caster et al's No. 1 Giesecke, 330 ft. from N and 713 ft. from E, Sub. 3, Blk. 130, J. Hughes Sur. 227.
S.D. 502 ft.

Schleicher County

John M. Cooper et al's No. 1 Bert Page, 1,290 ft. from N line, 1,470 ft. from W line of Sec. 40, Blk. L, G.H.&S.A. Sur.
T.D. 6,257 ft.; P.B. to 5,555 ft.; acidized and made estimated 6,000,000 ft. gas; C.O. to bottom.

W. C. Proctor et al's No. 1 Judkins & Spencer, C SW ¼ Sec. 4, Blk. V-28.
S.D. 2,205 ft.

Scurry County

Coffield & Guthrie's No. 1 Wade, 990 ft. from N and 330 ft. from W, Sec. 116, Blk. 97, H.&T.C. Sur.
S.D. 2,410 ft.; pumped 7½ bbls. oil in 36 hrs.

Magnolia Pet. Co.'s No. 1 W. M. Scott, 330 ft. from S and W, Sec. 186, Blk. 3, H.&G.N. Sur., 5 miles S of Snyder.
Elev. 2,341 ft.; drlg. 3,640 ft.

Sutton County

Fleetborn Oil Corp.'s No. 1 G. S. Allison, 660 ft. from S and W, Sec. 49, Blk. A, G.W.T.&P. Sur.
Ready to spud.

Taylor County

Brown Eagle Oil Co.'s No. 1 C. M. Caldwell, 175 ft. from N and 265 ft. from E, 170-ac. tract, Sec. 32, Blk. 14, T.&P. Sur.
Drlg. 1,562 ft.

Tom Green County

Mays Oil Co.'s No. 1 I. Funk, 1,980 ft. from S and 660 ft. from W, Sec. 38, Blk. 5, H.&T.C. Sur.
T.D. 990 ft.; ran csg.

Twin Oil Co.'s No. 1 W. E. Green, 1,050 ft. from N and 1,400 ft. from W, L. P. Moore Sur. 169½.
S.D. 315 ft.

Upton County

Humble O. & R. Co.'s No. 1 Pollock, C of NW Sec. 4, Blk. M.
Drlg. 10,852 ft.

J. G. McKenzie's No. 1 Taylor, 1,650 ft. from S and 330 ft. from E lines of Sec. 32, Blk. B-2, G.H.&S.F. Sur.
T.D. 630 ft.

W. C. Ray's No. 1 Cordova-Union, 2,035 ft from S and 2,595 ft. from W of NE¼ Sec. 2, A.B. Sur., 5 mi. SE of McCamey.
S.D. 2,082 ft.; 1,500 ft. oil in hole.

A. E. Lynch et al's No. 1 Sherk, 330 ft. from N and E, Sec. 25, Blk. 3, M.K.&T. Sur., 2 mi. E and 8 mi. N of McCamey.
Fishing 465 ft.

Ward County

Abell Brothers' No. 1 Lancaster Estate, 294 ft. N 20 degrees and 15 minutes W of NE cor. Sec. 61, Blk. 8, H.&G.N. Sur. in Pecos County, 5½ miles down Pecos River from NW cor. of Pecos and E cor. of Reeves County.
Spudded and shut down.

Alexander's No. 1 Richter, 1,650 ft. from NW, 1,170 ft. from NE line of Sec. 37, Blk. 34, H.&T.C. Sur.
S.D. 2,463 ft.

California Co. et al's No. 1 McFarland, 990 ft. from NE and 330 ft. from SE Sec. 29, Blk. 34, H.&T.C. Sur.
T.D. 2,535 ft.; shot; testing.

C. Cochran's No. 1 K. Greene, 990 ft. from NW and 2,980 ft. from SW, Sec. 29, Blk. B-29, P.S.L. Sur.
Drlg. 660 ft.

Eastland Oil Co.'s No. 1 Johnson, 330 ft. NW and NE, Sec. 24, Blk. 34, H.&T.C. Sur.
T.D. 2,570 ft.; testing.

Empire G. & F. Co.'s No. 2 Smith, 990 ft. from N and 1,650 ft. from E, Sec. 5, Blk. F.
Drlg. 2,726 ft.

Ice & Luce's No. 1 Baker, 1,650 ft. from NE and 330 ft. from NW, Sec. 15, Blk. 5, H.&T.C. Sur.
T.D. 2,585 ft.; P.B. to 2,480 ft.; C.O. and testing.

Stanolind O. & G. Co.'s No. 1 W. H. Martin, 1,650 ft. SW and 330 ft. from SE Sec. 40, Blk. 34, H.&T.C. Sur.
Coring 2,500 ft.

Wahlenmaier et al's No. 1 Potts, 990 ft. from SW and 330 ft. from SE, Sec. 31, Blk. B-29.
Spudded.

Winkler County

Atlantic Oil Prod. Co.'s No. 1 Simmons, 2,310 ft. from S and 330 ft. from E, Sec. 36, Blk. 26, P.S.L. Sur.
Location.

Cree & Hoover's No. 1 Crowe, 2,310 ft. from S and 330 ft. from W, Sec. 14, Blk. B-5.
S.D. 3,203 ft.; filled up 15 ft. in 1 hr.

Emperor Oil Co.'s No. 1 Continental-Holley, 330 ft. from S and 2,310 ft. from W, Sec. 12, Blk. B-12.
Drlg. 75 ft.

Gulf Prod. Co.'s No. 3 Keystone Cattle Co., 330 ft. from N and W of NE¼ Sec. 11, Blk. B-3.
T.D. 3,765 ft.; P.B. 3,420 ft.; testing.

Gulf Prod. Co.'s No. 4 Keystone Cattle Co., 330 ft. from N and E, Sec. 20, Blk. B-3.
T.D. 3,756 ft.; P.B. 3,375 ft.; S.D.

Gulf Prod. Co.'s No. 7 Keystone Cattle Co., 330 ft. from N and W of SW¼ Sec. 14, Blk. B-2.
Elev. 2,954 ft.; T.D. 3,715 ft.; P.B. 3,-672 ft.; flowed 126 bbls. in 14 hrs.

Gulf Prod. Co.'s No. 8 Keystone Cattle Co., 330 ft. from S and W of Sec. 11, Blk. B-2.
Elev. 2,964 ft.; T.D. 4,462 ft.; to shoot.

Gulf Prod. Co.'s No. 9 Keystone Cattle Co., 330 ft. from S and W of Sec. 13, Blk. B-2.
Elev. 2,946 ft.; S.D. 4,126 ft.

K-D Oil Co.'s No. 1 P. Mitchell, 1,650 ft. from N and 2,310 ft. from E, Sec. 33, Blk. B-10, P.S.L. Sur.
Cable tools rigged up.

Mascho Oil Co.'s No. 1 Evans, 1,320 ft. from N and W, Sec. 8, Blk. 56.
S.D. 80 ft.

Mascho Oil Co.'s No. 1 Evans, 1,170 ft. from N and 1,320 ft. from W, Sec. 46, Blk. 73, P.S.L. Sur.
S.D. 180 ft.

Richardson's No. 1 B. F. Jenkins, 440 ft. from S and E, Sec. 13, Blk. 77, P.S.L.
T.D. 3,498 ft.; shot; flowed 200 bbls. in 24 hrs.

Crafton Oil Co.'s No. 2 Pure-Walton, 2,-200 ft. N and E, Sec. 1, Blk. 3-B. Material.

Crafton Oil Co.'s No. 1 Pure-Walton, 440 ft. E and 1,320 ft. S, Sec. 2, Blk. 3-B, P.S.L. Sur.
Drlg. 555 ft.

Skelly Oil Co.'s No. 3 Halley, 2,200 ft. from N and 1,320 ft. from E, Sec. 35, Blk. B-11.
T.D. 3,855 ft.; to shoot.

Siosi Oil Co.'s No. 1 Lowett, 330 ft. from N and E, Sec. 36, Blk. 26, P.S.L. Sur
T.D. 3,130 ft.; P.B. 3,091 ft.; shut in; blowing at intervals.

Sun Oil Co.'s No. 1 Crow, 440 ft. from S and W, Sec. 23, Blk. B-5.
Fishing 1,603 ft.

Sun Oil Co.'s No. 1 Walton, 2,200 ft. from S and 440 ft. from E, Sec. 8, Blk. B-3.
Drlg. 3,225 ft.

Westbrook's No. 1 Brown & Altman, 2,-310 ft. from N and E, Sec. 5, Blk. B-5.
T.D. 3,190 ft.; testing.

Thurman et al's No. 1 Seth Campbell 15-B-3, 330 ft. from S and 1,650 ft. from W lines of Sec. 15, Blk. B-3, P.S.L. Sur
Drlg. 3,022 ft.

Wahlenmaier et al's No. 1 Walton, 990 ft. from S and 330 ft. from E, Sec. 3, Blk. 26.
Location.

Wilgo Oil Corp.'s No. 1 Campbell, 900 ft. from N and 300 ft. from E Sec. 2, Blk. 5, P.S.L. Sur., 3 miles E of Kermit.
Elev. 2,884 ft.; T.D. 4,639 ft.; P.B. 3,800 ft.; swedging csg.

Yoakum County

C. J. Davidson et al's No. 1 Bennett, 1,-320 ft. from N and E, Sec. 678, John H. Gibson Sur.
Elev. 3,557 ft.; T.D. 5,090 ft.; shut down for 7-in. casing with 800 ft. oil in hole; show gas 3,400-10 ft. and 5,035-90 ft.; ran csg.; set 6⅝-in. csg. at 4,651 ft.; C.O. to 15 ft. off bottom; 2,000 ft. fluid in hole, mostly oil.

CRUDE OIL PRICES

Oklahoma, Kansas, North Central and East Central Texas

Corsicana (heavy) (June 17, 1933)	.80
East Texas	$1.00
Other fields	(See gravity table)

West Texas

Crane Upton, Crockett, Howard, Glasscock, Mitchell (Sept. 29, 1933).	$ .70
Ector, Winkler and Pecos Counties and Lea County, New Mexico (Sept. 29, 1933)	.75
Pecos County, Yates shallow Pool (Sept. 29, 1933)*	.65
Jones and Fisher Counties*	(See gravity table)

Rocky Mountain States

Iles, light (Sept. 29, 1933)	$ .96
Iles, heavy (Sept. 29, 1933)	.90
Florence, Colo. (June 17, 1933)	.90
Fort Collins and Wellington, Colo., (June 17)	(See Salt Creek prices)
Big Muddy (Sept. 29, 1933)	$1.01
Frannie, light (May 1, 1934)	.70
Frannie, heavy (Sept. 29, 1933)	.62
Salt Creek and LaBarge (Sept. 29, 1933)	(See Stanolind Mid-Continent price schedule)
Grass Creek, light (Sept. 29, 1933)	$1.18
Grass Creek, heavy (Sept. 29, 1933)	.62
Elk Basin (Sept. 29, 1933)	1.18
Rock Creek (Sept. 29, 1933)	1.02
Lance Creek (Dec. 16, 1932)	.92
Hudson (June 2, 1931)	.65
Lost Soldier (Sept. 30, 1933)	.88
Hamilton Dome, all grades (Feb. 16, 1935)	.57
Torchlight (Sept. 29, 1933)	1.18
Greybull (Sept. 29, 1933)	1.18
Pondera (Sept. 29, 1933)	1.25
Sunburst (July 19, 1935)	1.20
Cat Creek, Montana	1.07
Hogback (Sept. 29, 1933)	1.11
Lea County, N. Mex. (Sept. 29, 1933)	.75
Maljamar (Sept. 29, 1933)	.70
Artesia-Jackson (Dec. 1, 1933)	.75

Gulf Coast

Grade A and Grade B specification discontinued by leading buyers.	(See gravity table)
Hardin (Aug. 8, 1935)	$.93
Tomball (see note)*	1.15
Livingston (Sept. 29, 1933)†	1.00
Cleveland (Jan. 11, 1934)	1.00
Greta (June 29, 1935)	.80
Refugio, light	(See gravity table)
Refugio, heavy (June 29, 1935)‡	.80
Conroe	(See Conroe gravity table)
Markham and High Island	(See Gulf Coast gravity table)
Bosco, La. (Jan. 18, 1935)§	$ .90

Anahuac and Dickinson posted by Humble August 20, 1935, price of 94 cents per barrel on 30-30.9 gravity with 2 cents per degree increase with top 40 gravity $1.14.

Note—Tomball, effective September 29, by Humble Oil & Refining Co. and October 2 by Magnolia Petroleum Co., and November 10 by Stanolind Crude Oil Purchasing Co.

*Greta posted by Texas Co. †Shell Petroleum Corp. ‡Refugio heavy by Humble Oil & Refining Co. Cleveland and Hardin posted by Magnolia Petroleum Co. §Bosco posted by Pure Oil Co.

Middle Western States

OHIO OIL CO.

Lima (Feb. 1, 1935)	$1.15
Illinois (Jan. 5, 1934)	1.13
Princeton, Ind. (Jan. 5, 1934)	1.13
Plymouth	Shut in
Midland, Mich. (Sept. 30, 1933)*	$1.02
West Branch, Mich.	.86
Oceana, Mich. (Oct. 5, 1933)	.90
Somerset, Ky. (May 20, 1935)	1.13
Western Kentucky (May 22, 1935)	1.13

*Posted by Pure Oil Co. and Simrall Pipe Line Co. Producers Pipe Line Co. pays 5 cents per barrel over Pure Oil Co.'s posted prices. West Branch, Mich., posted by Simrall Pipe Line Co. Somerset, Ky., crude purchased by Ashland Refining Co., Ashland, Ky., and posted prices includes premium. Oceana posted by Old Dutch Refining Co. and Naph-Sol Refining Co.

North Louisiana and Arkansas

Smackover, Ark. (all grades)	$ .70
Tullos, Urania, La. (Jan. 13, 1934)	.87
Nevada, Ark. (Sept. 29, 1933)	.60
East El Dorado (Sept. 29, 1933)	.70
Converse, La. (Mar. 17, 1934)	1.03
Elm Grove, La. (Sept. 29, 1933)	.75
Holly, La. (Nov. 17, 1934)	1.03
Pleasant Hill, La. (Mar. 17, 1934)	1.03
Zwolle, La. (Mar. 17, 1934)	1.03
Champagnolle, Ark. (Mar. 17, 1934)	.81
Lisbon, Ark. (Mar. 17, 1934)	1.03
Stephens, Ark. (Sept. 29, 1933)	.70
Urbana, Ark. (Mar. 17, 1934)	.60
Other fields	(See gravity table)

South Central and Southwest Texas

Darst Creek	$ .87
Mirando (June 29, 1935)	.75
Luling (Sept. 29, 1933)	.75
Pettus	1.05
Salt Flat	.87
Lytton Springs (Sept. 29, 1933)	.95
Duval County (June 29, 1935)	.75
Saxet (June 29, 1935)	.80
Port Lavaca (July 1, 1935)	.80

Eastern States

TIDE WATER PIPE CO.

(Effective Oct. 29, 1935)

Bradford, Pa.	$2.15
Allegany, N. Y.	2.15

SOUTH PENN OIL CO.

(Effective Oct. 29, 1935)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field)	$2.15
Pennsylvania Grade Oil in Southwest Pennsylvania Lines	1.87
Pennsylvania Grade Oil in Eureka Pipe Line lines	1.82
Pennsylvania Grade Oil in Buckeye Pipe Line lines	1.87
Corning Grade Oil in Buckeye Pipe Line Co.'s lines	1.82

PENNZOIL CO.

(Effective Oct. 29, 1935)

Pennsylvania Grade Oil in National Transit Lines:	
Group A — Includes Cochran, Franklin, Hamilton and Doolittle districts.	$2.12
Group B — Includes Titusville district.	2.11
Group C — Includes Turkey and Tidioute districts.	2.10
Group D — Includes Bear Creek and Porkey districts.	2.09
Group E — Includes Edeneau, Bull Creek, Rough Run, Carbon, Dipner, Bradlin, McJunkin, Jameson, Kennerdell, Emlenton, Tiona, Lacey and Kinsua districts.	2.06
Price depends on length of pipe line haul to plant at Oil City.	

PURE OIL CO.

(Effective Oct. 29, 1935)

Cabin Creek, W. Va.	$1.82
Bradford Hollow, W. Va.	1.82
Kelly Creek, W. Va.	1.82

Canada

Ontario (Sept. 9, 1933):	
Petrolia*	$2.10
Oil Springs	2.17
Turner Valley (May 21, 1934):†	
Clear naphtha	2.55
Discolored naphtha	2.37
Crude oil, 50 gravity	2.19
Crude oil, 45 to 49.9	2.07
Crude oil, 40 to 44.9	1.80

*Imperial Oil, Ltd. †Imperial Oil, Ltd., and Regal Oil & Refining Co.

Mexico

Panuco*	$.845

*F.o.b. ship, based on September transactions and exclusive of production and export taxes and bar dues.

Crude Prices by Gravities

Gravity—	Oklahoma and Kansas 1	North Texas, Central Texas and East Central Texas 2	North Louisiana and Arkansas 3	Gray County, Texas 4	Carson, Hutchinson and Moore Counties, Texas 5	Conroe, Texas 6	Salt Creek, Wyo. 7	Gulf Coast, Texas and Louisiana 8	Gulf Coast, Texas and Louisiana 9	Cotton Valley, Louisiana 10
Below 20	....	....	....	....	....	....	....	$.82	$.82	....
20-20.9	....	....	....	....	....	....	....	.84	.84	....
21-21.9	....	....	....	....	....	....	....	.86	.86	....
22-22.9	....	....	....	....	....	....	....	.88	.88	....
23-23.9	....	....	....	....	....	....	....	.90	.90	....
24-24.9	....	....	....	....	....	....	....	.92	.92	....
Below 25	*$.76	....	....	....	....	....	....	....	....	$.70
25-25.9	*.78	....	....	....	....	....	....	.94	.94	.72
26-26.9	*.80	....	....	....	....	....	....	.96	.96	.74
27-27.9	*.82	....	....	....	....	....	....	.98	.98	.76
28-28.9	*.84	....	....	....	....	....	....	1.00	1.00	.78
Below 29	.84	$.70	$.70	....	....	....	$.84	....	....	....
29-29.9	.86	.81	.81	....	....	....	.86	1.02	1.02	.80
30-30.9	.88	.83	.83	....	....	....	.88	1.04	1.04	.82
31-31.9	.90	.85	.85	....	....	....	.90	1.06	1.05	.84
32-32.9	.92	.87	.87	....	....	....	.92	1.08	1.06	.86
33-33.9	.94	.89	.89	....	....	....	.94	1.10	1.07	.88
34-34.9	.96	.91	.91	....	....	....	.96	1.12	1.08	.90
Below 35	....	....	....	$.79	$.69	....	....	....	....	....
35-35.9	.98	.93	.93	.81	.71	$1.00	.98	1.12	1.09	.92
36-36.9	1.00	.95	.95	.83	.73	1.11	1.00	1.12	1.10	.94
37-37.9	1.02	.97	.97	.85	.75	1.13	1.02	1.12	1.11	.96
38-38.9	1.04	.99	.99	.87	.77	1.15	1.04	1.12	1.12	.98
39-39.9	1.06	1.01	1.01	.89	.79	1.17	1.06	1.12	1.12	1.00
40 and over	1.08	1.03	1.03	.91	.81	1.19	1.08	1.12	1.14	1.02

Tractor Speeding!

Arrest of a tractor driver, for speeding, believed to be the first on record, is reported by field representatives of the Ethyl Gasoline Corp. The vehicle, said to have been making 45 miles an hour, was of a new high-compression type, powered with leaded gasoline and equipped with rubber tires, headlights, radio and horn. In the course of a demonstration attended by farmers, the driver was given a summons by Montana state highway patrolmen on route 10 near Billings. The tractor has been undergoing tests of fuel performance in Minnesota, the Dakotas and Montana.

STANDARD OIL CO. OF CALIFORNIA

For current purchases of crude oil at the well in California (unless otherwise specified). All gravities above those quoted take highest price offered in that field. Standard Oil Co. prices effective November 1, 1935

Gravity—	Signal Hill	Seal Beach, Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canon	Athens, Rosecrans Dominguez	Elwood Terrace	Torrance	Richfield	Kettleman Hills	Whittier, La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall, McKittrick, Kern River	Mountain View	Midway-Sunset, Elk Hills, Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$.75	$.74	$.73	$.74	$.75	$.71	....	....	$.75	$.71	....	$.71	$.72	$.72	....	$.65	....	$.65	$.65	$.65	....
15-15.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	....	.65	.65	.65	....
16-16.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	....	.65	.65	.65	....
17-17.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	....	.65	.65	.65	....
18-18.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	....	.65	.65	.65	....
19-19.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	$.65	.65	.65	.65	$.65
20-20.9	.75	.74	.73	.74	.75	.71	....	....	.75	.71	....	.71	.72	.72	....	.65	.65	.65	.65	.65	.65
21-21.9	.75	.74	.73	.74	.76	.71	....	....	.75	.71	....	.71	.72	.72	$.73	.65	.66	.67	.65	.65	.65
22-22.9	.75	.74	.73	.75	.78	.72	....	....	.75	.71	....	.71	.72	.72	.73	.65	.67	.68	.66	.65	.65
23-23.9	.75	.74	.74	.76	.79	.73	$.75	....	.76	.71	....	.72	.73	.72	.73	.65	.69	.70	.67	.65	.65
24-24.9	.77	.74	.75	.77	.81	.74	.75	....	.77	.72	....	.74	.74	.73	.73	.65	.71	.71	.69	.65	.65
25-25.9	.78	.75	.76	.78	.82	.75	.76	....	.78	.73	....	....	.75	.74	.73	.66	.72	.73	.70	.66	.66
26-26.9	.79	.76	.78	.79	.83	.76	.77	....	.79	.74	....	....	.76	.75	.73	.67	.74	.74	....	....	....
27-27.9	.80	.78	.79	.80	....	.77	.79	....	....	.75	....	....	....	.77	.74	.68	.76	.76	....	....	....
28-28.9	.81	.79	.80	.81	....	.79	.80	....	....	.76	....	....	....	.78	.75	.70	.77	.77	....	....	....
29-29.9	.82	.81	.81	.82	....	....	.82	....	....	.78	....	....	....	.79	.77	.71	.79	.78	....	....	....
30-30.9	.83	.83	.82	.83	....	....	.83	....	....	....	....	....	....	.80	.78	.72	.81	.80	....	....	....
31-31.9	....	....	....	.84	....	....	.84	....	....	....	....	....	....	.81	.79	.74	.83	....	....	....	....
32-32.9	....	....	....	.85	....	....	.86	....	....	....	....	....	....	.82	.81	.75	.84	....	....	....	....
33-33.9	....	....	....	....	....	....	....	$.84	....	....	$.81	....	....	.83	.82	.76	.86	....	....	....	....
34-34.9	....	....	....	....	....	....	....	.85	....	....	.83	....	....	.85	.83	.77	....	....	....	....	....
35-35.9	....	....	....	....	....	....	....	.86	....	....	.84	....	....	....	.85	....	....	....	....	....	....
36-36.9	....	....	....	....	....	....	....	.88	....	....	.86	....	....	....	.86	....	....	....	....	....	....
37-37.9	....	....	....	....	....	....	....	.89	....	....	.87	....	....	....	.87	....	....	....	....	....	....
38-38.9	....	....	....	....	....	....	....	....	....	....	.88	....	....	....	.89	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	.90	....	....	....	....	....	....	....	....	....	....

Playa Del Rey prices f.o.b. their pipe line. Elwood Terrace prices f.o.b. ship. All purchasing companies met the above prices.

PERSONAL

PHILIP W. WRIGHT, production superintendent for the Anglo-Iranian Oil Company, Ltd., is in the Mid-Continent this week studying production practices and after attending the Los Angeles meeting of the American Petroleum Institute will return to Iran.

ROBERT E. ROGERS, JR., having returned to the United States after a sojourn of a year and a half as instrument and process engineer for refineries in the Netherlands West Indies, has rejoined the engineering-sales staff of the New York office of the Foxboro Company, Foxboro, Mass.

MARTIN W. STRONG, engineer for the Anglo-Iranian Oil Company, with offices in Britanic House, Finsbury Circus, London, England, is visiting various properties of the Shell Petroleum Corporation in the Mid-Continent and will this week attend the annual convention of the American Petroleum Institute in Los Angeles before returning to London.

F. LEE STEWART, Tulsa, was in Wilmington, Del., and New York City last week.

J. D. (JIMMY) THOMPSON, JR., consulting geologist at Amarillo, Tex., is ill at St. Anthony's Hospital in that city.

H. W. COLEMAN, formerly head of the sales department of the Simms Oil Company, Dallas, Tex., is now in Birmingham, Ala.

BOB CRIPPEN, of the Texas Company, is the skipper of a group of Sea Scouts, who operate their own training ship called the Viking.

HARRY LEYENDECKER, chief scout for the Tide Water Oil Company at Houston, Tex., has returned from a business trip through Coastal Louisiana.

A. F. MORRIS, assistant chief geologist of the Empire Gas & Fuel Company, Bartlesville, Okla., has returned to headquarters after a trip over Texas with company men.

NEIL BUCKLEY, in charge of the Mid-Continent offices of Cities Service Export Oil Company, returned to Tulsa last week from a visit to New York offices of the company.

LEONARD E. PARKER, of the Union Oil Company's Oleum refinery force, put his first aid training to good use recently in Yosemite Park when an automobile party ran off the highway and dropped off a steep cliff approximately 100 feet.

EUGENE W. PEMBLETON, of the refining and marketing division of the Cities Service Company, New York, has been appointed vice president and general manager of the A. R. Newcombe Oil Company, Kingston, N. Y. Mr. Pembleton spent several years with the Cities Service oil interests in the Mid-Continent before going to New York.

JOHN RICHARDSON, formerly production superintendent of the Union Sulphur Company of Sulphur, La., has been transferred to Mercedes, Tex., where he will serve as superintendent of drilling and production. Before leaving for his new assignment, a dinner-dance was given in his honor by his assistant and supervisors. J. D. BRACK, assistant to Mr. Richardson, was promoted to drilling superintendent in the Lake Charles district.

The Society of Mexican Pilgrims, including many men prominent in the oil industry, held an informal dinner October 29 at Mexican Gardens in New York, attended by approximately 100 members and their guests. Among those present were THOMAS E. WARD, of the Oilfield Equipment Company, president of the society; JAMES W. EVANS, Pierce Oil Corporation; G. C. DONNELLY, Gilbert & Barker Manufacturing Company; DEAN FULLER, formerly president of Warner-Quinlan Company, and E. A. WETMORE, Gulf Oil Corporation.

W. L. CUPIT, formerly stationed at the Hull district for Humble Oil & Refining Company, has been transferred to the Hastings district as district chief clerk and warehouseman.

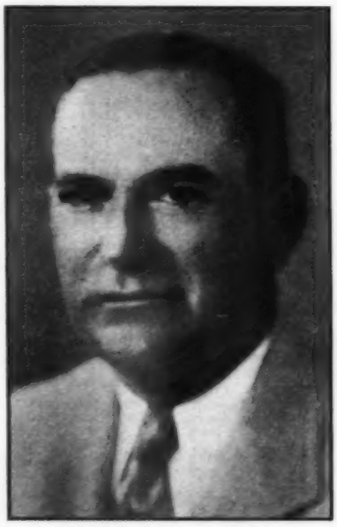
ROBERT J. GIVEN, petroleum engineer, formerly with the Shell Petroleum Corporation, is now associated with W. B. PARDOE of the Dapar Oil Company at Alma, Mich.

CHARLES C. ROSS, Minister of Lands and Mines for Alberta, recently visited Calgary, Alberta, where he conferred with oil operators in reference to development problems in southern Alberta.

RAY E. MILLER of Hanlon & Buchanan, Inc., has been elected chairman of the Tulsa chapter of the American Petroleum Institute, succeeding J. R. McWILLIAMS of the Carter Oil Company, temporary chairman. GEORGE A. SCHWAB, superintendent of the land and scouting department of Barnsdall Oil Company, new first vice chairman, succeeds H. M. COSGROVE, manager of the Purchasing Agents Association of Tulsa. O. G. HOUSER, district sales manager of Continental Supply Company, is second vice chairman, taking the place temporarily filled by B. P. SIBOLE of the Stanolind Crude Oil Purchasing Company.

In Two Magnolia Units

As the result of his recent election as secretary of Magnolia Petroleum Company and Magnolia Pipe Line Company Guy L. Tate now is in the service of two units of the organization with which he did his first work in the oil industry as a boy of 19. Mr. Tate was born in Corsicana, Navarro County, Texas, in 1892. When Magnolia Petroleum Company was building its first trunk pipe line from Electra to Beaumont, in Texas, in the fall of 1911, Guy got a job with the stringing gang tallying pipe. When this project was completed in 1912 the oil industry had to get along temporarily without Guy, who for a time graced the personnel of a grocery store as delivery boy. One day the boss said, "Guy, you look like sin on that wagon. I'll try you out as a stock clerk." After this promotion Guy dreamed of still higher things and 1914 found him cashier of an ice company.



GUY L. TATE

In 1916 the young man returned to the Magnolia Petroleum Company in Dallas, Tex., as a clerk in the oil run department, and he has been with that organization since then, filling various positions in different departments in the general offices and accumulating a thorough knowledge of the office system of a big oil company.

Mr. Tate was elected assistant treasurer in March, 1931, and assistant secretary in March, 1935. Advancement to secretary of the two Magnolia organizations followed a few months later. Mr. Tate is a member of the Lakewood Country Club, Dallas, where he indulges his fishing hobby when work permits. He is an enthusiastic hunter and golfer.

L. T. BOYNTON has moved the offices of the West Texas Production Company from San Angelo to Midland, Tex.

HUGH ALLSPAUGH, independent operator of Amarillo, Tex., is home after a long period in a Wichita, Kans., hospital.

ALEXANDER VORONCA, Rumanian oil official, left New York November 2 on the Lafayette of the French Line.

LEO RANNEY has returned to Petrolia, Ontario, after a two months' business trip to Lisbon, Portugal, and Paris, France.

R. OGARRIO, vice president of the Texas Company in charge of production, is in Denver conferring with local officials.

E. M. BEDFORD, of the Western Gulf Oil Company, is the proud father of a 7½-pound boy born in Los Angeles October 27.

E. J. LEABOW, chief accountant of the Burnham Exploration Company, is hobbling around on crutches due to an infection.

M. T. RATHVON, field superintendent of the Argo Oil Company, has returned to Casper, Wyo., headquarters from a vacation trip to the Pacific Coast.

CECIL R. HADEN of the Crush-Shell Company at Houston, Tex., was one of many Houstonians who made a trip to Washington, D. C., to watch the Rice University-George Washington football game last week.

E. J. SADLER, vice president and director, and T. C. McCOBB, director, Standard Oil Company (New Jersey), and F. W. ABRAMS, president of the Standard Oil Company of New Jersey, headed a party of officials that visited Houston, Tex., the past week.

PARAGRAPHS

H. V. DENNIS, managing director of H. W. Dennis & Company, Ltd., oil valve manufacturer, is leaving shortly for South America, and will not return to London until the end of December.

J. M. ROBERSON, of Cody, Wyo., petroleum engineer, and MRS. ROBERSON, were in Casper, Wyo., the past week. Mr. Roberson, formerly with the Standard at Casper, has recently been engaged in supervising the building of various refineries in the mountain states.

OTTO D. DONNELL, of Findlay, Ohio, president of the Ohio Oil Company, and son, JOHN DONNELL, visited at the Marathon Oil Company offices, Tulsa. They were accompanied on a tour of Marathon properties by PRESIDENT WALTER W. FLEMING and FRANK R. CLARK, chief geologist. The Donnells are en route to Los Angeles.

COL. W. F. ROCKWELL, president of Merco Nordstrom Valve Company and Pittsburgh Equitable Meter Company, accompanied by MRS. ROCKWELL, is en route to Los Angeles to attend the A.P.I. convention, voyaging via Panama on the St. Helene. After the convention he will spend some time on the coast in the interest of his two companies.

H. A. NEEDOM, geologist of Tulsa, is home from a recent trip to Mexico City.

A. L. ELLSWORTH, president of the British-American Oil Company of Toronto visited Calgary recently in connection with the company's plans to assist development of Turner Valley and other Alberta fields.

FRANK O. WILKINS, superintendent and manager of the W. Hunter Atha Oil Company in central Michigan, has resigned to establish an independent pipe-pulling company with headquarters in Mount Pleasant, Mich.

THOMAS G. KELLIHER, acting director of the Federal Petroleum Agency, Kilgore, is in Washington, D. C., on business. G. W. VAN FLEET, former acting director of the Federal Petroleum Agency, Kilgore, Tex., is also in Washington, D. C.

THOMAS E. RICE, a divisional credit manager of the Associated Oil Company, who narrowly escaped death recently in an automobile accident, in Arizona, arrived in Los Angeles a few days ago by train. He will be confined to his home for the next several weeks.

E. M. CRAIG, president and managing director, and H. G. HARDING, secretary-treasurer, of the Mar Jon Oil Company of Vancouver, British Columbia, recently visited the Turner Valley Field and inspected the company's operations on the Watson structure in southern Alberta.

FRANK O. PRIOR, president of Stanolind Oil and Gas Company; E. F. BULLARD, vice president; H. W. KLEIN, general superintendent, and A. L. SOLLIDAY, manager of the exploration department, accompanied PRESIDENT E. G. SEUBERT and a party of Standard Oil Company (Indiana) officials on a tour of the Gulf Coast.

HAROLD THORNE, refinery engineer from the Bureau of Mines at Laramie, Wyo., was at the Fern refinery in Thermopolis, Wyo., making a survey regarding methods of refining.

SHELBY VAN BURGH, assistant superintendent of the Continental Oil Company at Casper, Wyo., has been on a hunting trip into the Ferris Mountains near the Pedro and Green Mountains.

H. W. CAMP, general superintendent of refineries for the Empire Oil & Refining Company, left Tulsa this week to visit various refining points along the Pacific Coast and plans to attend the A.P.I. meeting at Los Angeles, Calif.

L. D. MANN, assistant general superintendent of refineries for the Empire Oil & Refining Company, with offices in Tulsa, is in New York City attending conferences being held for various operating units within the Cities Service organization.

F. R. MARKLEY, export manager of the Sun Oil Company, Philadelphia, Pa., is in London, England, on a visit to the British Sun Oil Company.

C. R. DOOLEY, industrial relations manager of the Socony-Vacuum Oil Company, Inc., New York City, has been appointed chairman of the Petroleum Division of the United Hospital Campaign Committee.

W. H. (PETE) MORRISON, chief petroleum engineer of the Shell Petroleum Corporation, and M A. SHERWOOD of the mechanical department, of St. Louis, Mo., went on a hunting trip to New Mexico last week.

WILLIAM KYLE, of Cheyenne, Wyo., is recovering satisfactorily at the Mayo Brothers clinic in Rochester, Minn., where his arm was operated on. He discovered the famous well in the Big Medicine Bow Field of Wyoming.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

A. F. Corwin, of Pittsburgh, Pa., general superintendent of the South Penn Oil Company; F. H. Oliphant, Oil City, Pa., geologist, and George O. Moody, of Titusville, Pa., embark on a six months' trip which will take them as far east as Hong Kong, China.

The Standard Oil Company of Louisiana buys the properties of the J. C. Trees Oil Company in Louisiana. The reported price was $9,000,000. The deal includes 8,000 bbls. of production and 104,000 acres of leases. The Trees company is made up of J. C. Trees, M. L. Benedum, Harry S. Grayson and H. S. and C. E. Glenn.

T. A. Sangster, veteran oil well supply man in the eastern fields, dies in Bradford, Pa. He was an uncle of T. J. Donoghue of the Texas Company, Houston, Tex.

20 YEARS AGO

Wilbur T. Funk, producer in the Eastern fields, is in Oklahoma, and may extend his interests to the Mid-Continent.

Frank A. Gillespie, wealthy Tulsa oil producer, has purchased an 8,000-acre ranch in Johnston County, and a 2,500-acre ranch in Wagoner County, both in Oklahoma. He bought one for himself and the other for his two sons.

Jesse H. Jones is planning the erection of a 10-story building in Houston, Tex., which will house the forces of the Gulf organization.

10 YEARS AGO

Sir Henri Deterding disagrees with Sir Richard Redmayne who predicts that America's oil supply will be exhausted by 1940.

S. W. Munn, veteran tool fisher and inventor of fishing tools, dies in Glendora, Calif., aged 76 years.

Olean Petroleum Company opens up Wilcox sand production in the Ingalls Pool in Oklahoma.

W. B. Hassett, president of the Imperial Refining Company, and Mrs. Sallie Fetter Lindenberger were married on November 5, in Lexington, Ky.

WILLARD L. MILLER, vice president in charge of geology of the Ramsey Petroleum Corporation, spent several days in Tulsa.

FRED MANNING of the Manning & Perry Drilling Company of Denver, Colo., was in Casper, Wyo., attending to company business.

JOHN C. SHARP, formerly with Industrial Petroleum Company, Tulsa, has joined the staff of Kay Pipe Line Company, headquarters at Lyons, Kan.

FRANK J. GRUNDER, field salesman with the Frick-Reid Supply Corporation, formerly at Ponca City, Okla., is now located in the Tulsa sales office of the company.

JIM HUGHES, president of the Eastman Oilwell Surveying Company, at Houston, Tex., announced the arrival of a 5-pound baby daughter the past week.

M. H. LOWRANCE and family are visiting with his parents in Thayer, Kans., for about a week. Mr. Lowrance is land man for Sinclair Prairie Oil Company at Fort Worth, Tex.

COMAR PLUMMER, assistant to the vice president of production; R. D. CARR, chief petroleum engineer, and E. B. SLOAN, manager of the material department of the Pure Oil Company, were visitors in Tulsa.

L. V. CASSADAY, of the Lomita Gasoline Company, and WILLIAM GORDON, formerly assistant umpire under NEAL H. ANDERSON and now connected with the A. T. Jergins Trust, recently landed two Marlin swordfish within five minutes of each other while deep sea fishing off Catalina Island. Mr. Gordon's catch weighed 196 pounds and required 1 hour and 28 minutes to land, while Mr. Cassaday's catch weighed 178 pounds and required two hours and five minutes to bring in.

Advances in Refined Product Markets Were Chief Feature on East Coast

By C. O. WILLSON

NEW YORK, Nov. 4.—More advances in refinery products were made effective in eastern markets over the past week than any similar period in several months. It was predicted today that before the end of the week, additional price increases would be announced.

Kerosene tank car prices were advanced to 5 cents in the New York harbor area with 4⅞ cents the prevailing price for small barge shipments. This was accompanied by increases of one-eighth to one-fourth cent in all grades of furnace oils and range oils by the larger refiners. The top tank car price on No. 1 furnace oil and range oil is now 5 cents with some material available at 4⅞ cents. The Nos. 2 and 3 are quoted at 4 cents and No. 4, 3¾ cents. Barge prices are one-eighth cent lower.

Crude scale wax has been strengthening over the past two weeks in both export and domestic sales. Prices on the 124-126 grade both white scale and yellow scale, range from .0220 to .0225 cents per pound. The demand for most of the refined grades has also improved but so far no changes in quotations have been made effective.

Bright stock export prices were again advanced one-half cent and the new price for the No. 8 in barrels (Pennsylvania Grade) is now 26 cents and 25½ cents for the 6½ color. The export movement of this product has improved over the past 30 days.

Probably the most important development of the week was the indication that tank car prices along the Atlantic Seaboard would be advanced in the near future. An unusual situation has developed in which independent marketing organizations are taking the lead in advancing prices. The usual procedure is for these companies to follow the price advances made effective by the major companies and their leadership in the past has been largely confined to price reductions.

Continued Demand

Last week the Hartol Products Corp., an independent marketing organization, which is a large cargo buyer of petroleum products for export shipment and domestic distribution along the Atlantic Seaboard, advanced its tank car price on 65 octane U. S. Motor to 6½ cents at New York, Boston and Philadelphia. This advance of one-fourth cent was attributed in a company statement to "continued consumer demand, increase in export demand and a general strengthening of all petroleum products." Up to this writing the major companies which make spot tank car sales in this grade had not generally advanced to this level. It was predicted that a general increase in all grades of gasoline sold on a tank car and barge basis would be made effective by the major companies this week.

As explained in these columns last week there has been a gradual tightening in the tank car gasoline market in this territory, especially in the grades of 65 octane or higher. The fact that brokerage and marketing organizations find it expedient to advance their tank car prices indicates that the cargo market is strong. These companies buy from large and small refiners on a cargo basis and for their profit must depend on the margin between this buying price and the prevailing tank car quotations at the points where they maintain water terminals. Most of the material for this territory is bought by these companies at the Gulf. The latter market has been advancing slowly and last week is was said that the high octane material was difficult to find even in cases where the buyers were willing to pay more than 5½ cents.

There is the additional fact that rates on tankers have increased recently. This was a factor also in the advance in furnace oil prices previously explained. Tanker rates from the Gulf in the movement of these light distillates have recently advanced to around 22½ cents per barrel, an increase of 5 cents over the rates in effect a few weeks ago.

In the western part of New York state where retail gasoline markets have been unsatisfactory for some time, the Socony-Vacuum Oil Co., Inc., and other major companies last week were able to make advances in tank car posted prices. A new price of 7.67 cents per gallon was established at Buffalo, and 7.74 cents at Rochester. They represent increases of one-half cent a gallon. At Syracuse and Utica, the new prices are 7.49 and 7.33 cents, respectively, made possible by increases of .29 cent. The increases are said to reflect improved competitive conditions from the Pennsylvania group of refiners where refining gasoline quotations have recently strengthened.

It is probable that general advances of one-half cent in gasoline tank car prices will materialize in this section without any changes in the posted dealer and service station schedules except at points where the prevailing quotations are subnormal. It is felt that the spreads between tank car and service station prices have been too wide and they should be narrowed, at least during the winter months. With independent marketing units seeking higher rather than lower tank car prices, market observers feel that conditions in this territory point to stable market conditions during the winter months. They contend that the next move should come from the major companies not only in posting higher prices at their refineries but also doing away with the exceptionally wide margins often given to dealers and jobbers on contracts.

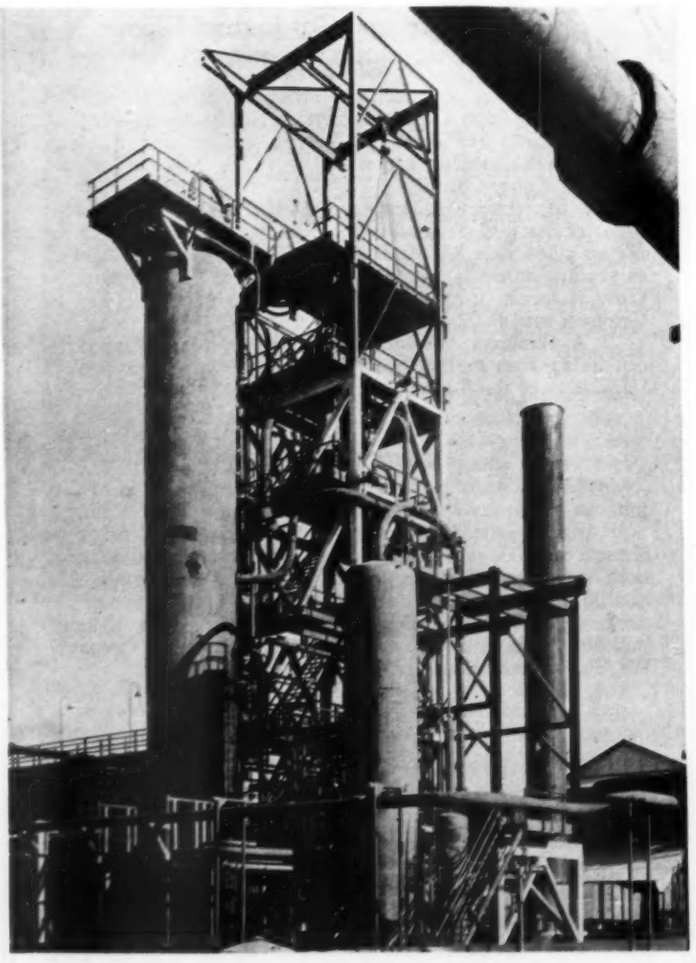
Export Markets

The flood of inquiries from European buyers seeking quotations on gasoline starting in early October has ended but quotations at the Gulf continue steady. The price range on the 64-66 375 grade is 5⅝ to 5½ cents with a price schedule down to 5⅛ cents on U. S. Motor. It is said that the French buyers were able to cover their immediate requirements through purchases in this and other countries but more inquiries during the latter part of this month are predicted.

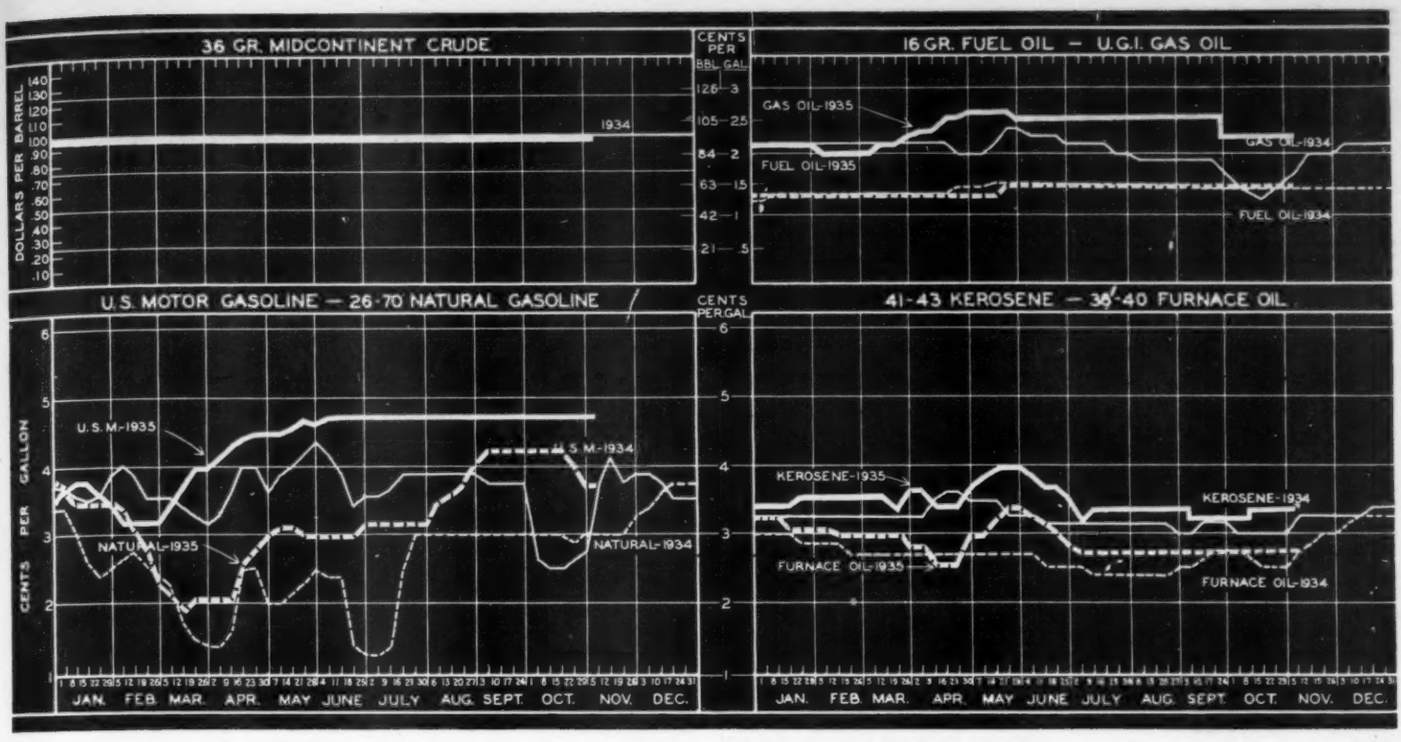
A report issued by the Department of Commerce during the past week indicates the increase in export business over the past year. This gain in September compared to September, 1934, amounted to almost 3,000,000 bbls., or 100,000 bbls. daily. The accompanying table shows the exports from this country for the two months; data in barrels.

COMPARISON OF EXPORTS FROM UNITED STATES

	September	
	1935	1934
Petroleum, crude	4,970,884	4,068,147
Natural gasoline	193,659	106,810
Gasoline, naphtha and other finished products, in bulk	2,614,521	1,554,638
Gasoline, naphtha and other finished light products, in containers	63,307	121,941
Illuminating oil, in bulk	687,610	702,459
Illuminating oil, in containers	62,207	86,496
Gas oil and distillate fuel oil	1,907,921	1,045,540
Residual fuel oil	1,060,810	1,033,488
Lubricating oil, red and pale	457,527	426,025
Lubricating oil, black	46,151	46,426
Lubricating oil, cylinder	186,911	155,047
Total	12,251,508	9,346,917
Data in gallons:		
Mineral spirits	241,450	110,352
Insulating or transformer oils	153,937	161,277
Light lubricating oils, in small packages	28,730	30,119
Data in pounds:		
Lubricating greases	6,886,564	8,107,188
Paraffin wax, unrefined	9,713,139	9,435,349
Paraffin wax, refined	11,896,240	11,817,542
Data in tons:		
Petroleum asphalt	14,800	15,053
Petroleum coke	7,744	5,743



General view of distillation and fractionation equipment at Avon refinery of Associated Oil Co.



Consumption of Gasoline Tapering, But Tank Car Prices in Group 3 Steady

By T. F. SMILEY

Motor fuel consumption in the territory supplied by Group 3 refiners was tapering more noticeably this week as a result of weather calculated to discourage pleasure driving, but no weakening of prices was apparent. As a matter of fact there was speculation as to whether the tank car gasoline price line might not preserve to the end of the year the same horizontal rigidity it has maintained since the first week in June. Nobody is making any bets that it will, of course, for market history is in impressive disagreement with such an augury; but gasoline has tipped over so many precedents this year there is no telling.

With the close of the vacation season the trade remarked, "Well, it was a nice summer's business all right," and prepared for the usual recession. One thing and another kept the price throughout September right where it had been.

Not This Time

Of course October would see a falling off. It always did.

But with the directness of a rifle bullet the price line adhered to its eastward course across the graph. There was general agreement that the market was as strong as it had been at the height of the consuming season.

And here is November, with the market exhibiting nothing resembling nervousness or anemia and with the price line striding straight ahead. Official figures are expected to show October broke all records for that month in the United States in point of gasoline consumption. This expanded gallonage, along with the saner marketing practices that now prevail, enables refiners and sellers to approach the year's end in a cheerful mood.

The improved situation in California tended to brighten feeling in the Group 3 and other districts, although California had not been regarded as a really serious market threat for weeks.

Improvement in natural gasoline, observable last week following a half-cent slash in the price of 26-70 in Texas and a downward revision of all but the 18-pound grade in Oklahoma, has become more pronounced with the better buying induced by the more inviting quotations. Cargo purchases for coastwise or export movement are reported to have drawn on Gulf storage at a faster rate than shipments have been made to that point from refineries, with the result that terminal inventories are much lower. Natural gasoline produced in Texas in the immediate future will go to the Gulf to replenish stocks there, thus removing it as a competitor of Oklahoma natural in both Oklahoma and northern areas and creating a much better balanced market.

Possibility of another shutdown of plants in the Texas Panhandle appeared this week as a further bracing market influence. These plants, closed last August, when the new gas conservation law in Texas became operative, reopened later under injunctions and have continued to run. The validity of the law under which the Texas Railroad Commission ordered the August shutdown is expected to be passed on by a three-judge court this month, and the feeling among some manufacturers is that the section of the law relating to gas wastage will be upheld and that the shutdown will be resumed and made permanent, thus taking some 250,000 gallons of natural gasoline daily off the market. The whole outlook, however, is foggy.

Cold Weather Would Help

Kerosene lacked life. So did the light fuels, though prolongation of the colder weather doubtless would have a bracing effect on this class of material. It would require several weeks of low temperatures to exert any market influence on actual tank car sales for the reason that jobber storage is well filled and it will take more than one or two minor cold waves to draw on it enough to start new buying. The low gravity fuels were exhibiting a slightly better tone. With the approach of winter, refiners have been reducing their cuts of kerosene and correspondingly increasing their output of furnace oils, so the two groups are in balance and in a position to respond to strengthening influences.

Bright stocks and neutrals were strong, and inventories of both were reported low throughout the Mid-Continent. U.G.I. gas oil drooped a little. There was a taker for every pound of wax produced, but recent active demand, especially for export movement, had depleted stocks so that some refiners reported they were sold out.

Refined Oil Market Barometer

Improved market tone discernible in almost all products and in virtually all areas. Higher prices for both crude and gasoline in California were a quickening influence in other districts. Export business has had a bracing effect too. Healthy domestic demand provides the major underlying factor, however, along with the disposition of operators to keep production more nearly limited to it.

MID-CONTINENT. Gasoline, lubricants steady. Naturals in better balance. Wax vigorous.

EAST COAST. General market improved, with many price advances recorded.

GULF COAST. Market steady, with better feeling concerning future business.

PENNSYLVANIA. Increasing strength displayed by gasoline, kerosene and wax.

CALIFORNIA. Gasoline up, heating oils strong, lubricants lower, kerosene firm.

CHICAGO. Gasoline strong, kerosene firmer, heating oils tightly held.

RETAIL OIL MARKETS

Tank wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of November 5, 1935

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county and city taxes. The gasoline is the regular or standard grade. In most areas a third grade and a premium grade are also available.

Discounts

Under the standard form of commercial consumer contract which went into effect March 1, 1934, save in California, Oregon, Washington, Arizona and Nevada, a discount of 1 cent a gallon off tank wagon or 3 cents a gallon off retail prices is permitted for purchases between 4,000 and 10,000 gallons per month, or 4 cents a gallon off retail prices for purchases in lots of more than 10,000 gallons a month. The minimum delivery is 25 gallons.

Standard Oil Co. (Indiana)

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Chicago	14.0	16.0	4.0	9.8
Decatur, Ill.	15.5	16.5	4.0	9.8
E. St. Louis	15.2	17.2	4.0	9.5
Joliet	15.5	16.0	4.0	9.8
Peoria	15.5	15.5	4.0	9.8
Quincy	15.3	17.3	4.0	8.0
Davenport, Ia.	15.5	(†)	4.0	9.8
Des Moines	15.3	(†)	4.0	9.6
Mason City	15.7	(†)	4.0	10.0
Sioux City	15.5	(†)	4.0	9.8
Duluth, Minn.	16.3	18.3	4.0	10.6
Mankato	15.9	17.9	4.0	10.2
Minneapolis	15.9	17.9	4.0	10.2
LaCrosse, Wis.	16.9	18.9	5.0	10.2
Green Bay	17.2	19.2	5.0	10.5
Milwaukee	15.3	16.8	5.0	10.1
Madison	16.9	18.9	5.0	10.2
Detroit, Mich.	13.5	15.5	4.0	9.3
Grand Rapids	15.6	16.6	4.0	8.0
Saginaw	16.1	18.1	4.0	9.3
Evansville, Ind.	17.2	19.2	5.0	10.3
Indianapolis	17.4	19.4	5.0	10.5
South Bend	17.6	19.6	5.0	12.0
Fargo, N. Dak.	16.9	18.9	4.0	11.2
Huron, S. Dak.	17.4	19.4	5.0	10.7
Sioux Falls	16.9	18.9	5.0	10.2
Kan. City, Mo.*	12.9	14.9	4.0	7.0
Springfield	14.6	16.6	4.0	8.9
St. Louis	15.2	17.2	3.5	9.5
St. Joseph*	14.9	16.9	4.0	9.2
Wichita, Kans.	14.4	16.4	4.0	6.8
Bartlesville, Ok.	16.0	18.0	5.0	8.8

*State tax 2 cents, 1-cent city tax and 1-cent federal tax.

†Standard Oil Co. (Indiana) has leased all service stations in Iowa.

Discounts to dealers: Undivided accounts, 1½ cents on premium and regular and 2½ cents on third grade off service station prices; divided accounts one-half cent less than undivided. Discounts to dealers in metropolitan Chicago one-half cent larger than rest of Standard of Indiana territory, namely 4 cents and 3 cents on respective grades. Where prices are more than 1 cent below normal, the discounts are one-half cent less than above.

Stanolex Furnace Oil in Chicago

Effective June 27, 1935, f.o.b. Chicago tank wagon prices: Range oil, less than 100 gallons, 8.5 cents; 100-149 gallons, 7.5 cents; 150 gallons and more, 7.0 cents. No. 1 (36-40 B. stw. zero), less than 100 gallons, 8.5 cents; 100-149 gallons, 7.5 cents; 150 gallons or more, 7.0 cents; No. 2 (36-34, stw. zero), same prices and quantities as No. 1; No. 3 (32-26, zero), less than 150 gallons, 7.2 cents; 150 gallons or more, 6.2 cents. No. 4 (32-16 zero), less than 400 gallons, 7.2 cents; 400 gallons or more, 6.2 cents, viscosity of No. 4, 85° and 100° F.: No. 5, less than 400 gallons, 5½ cents; 400 gallons or more 4½ cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Denver, Colo.	18.0	20.0	5.0	11.0
Pueblo	18.0	20.0	5.0	13.0
Grand Junction	20.5	22.5	5.0	15.0
Casper, Wyo.	18.5	20.5	5.0	11.5
Cheyenne	18.5	20.5	5.0	13.0
Butte, Mont.	21.0	23.0	5.0	17.5
Billings	19.5	21.5	6.0	16.5
Helena	21.5	23.5	6.0	17.5
Great Falls	20.5	22.5	6.0	17.5
Salt Lake, Utah	18.0	20.0	5.0	16.0
Twin Falls, Ida.	23.0	25.0	6.5	18.0
Boise	22.5	24.5	6.0	18.0
Albu'que, N. M.	20.0	22.0	*5.5	13.0

*One-half cent city tax.

Discount to dealers with or without contract in Continental territory: Undivided dealer discount off service station price, 4 cents; divided dealer accounts, 3½ cents.

Southern District

STANDARD OIL CO. OF KENTUCKY

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Atlanta, Ga.	20.0	22.0	7.0	12.0
Augusta	20.0	22.0	7.0	14.0
Macon	20.0	22.0	7.0	13.0
Savannah	18.0	20.0	7.0	14.0
Birm'ham, Ala.	21.0	23.0	8.0	12.0
Mobile	19.0	21.0	8.0	10.0
Montgomery	22.0	24.0	8.0	15.5
Jackson, Miss.	19.0	21.0	7.0	11.0
Vicksburg	19.0	21.0	7.0	12.0
Jacksonville, Fla.	18.5	20.5	8.0	10.0
Miami	18.5	20.5	8.0	13.5
Pensacola	19.0	20.0	8.0	11.5
Tampa	18.5	20.5	8.0	11.0
Lexington, Ky.	19.5	21.5	6.0	10.0
Covington	18.0	20.0	6.0	11.5
Louisville	18.5	20.5	6.0	10.0
Paducah	18.5	20.5	6.0	10.0

In addition to the state tax of 6 cents Montgomery, Ala., has a county tax of 1 cent per gallon and a city tax of 1 cent per gallon on gasoline, and one-half cent per gallon on kerosene. Mobile and Birmingham, Ala., each have a city gasoline tax of 1 cent per gallon. Pensacola, Ala., has a city gasoline tax of 1 cent.

Southwestern District

MAGNOLIA PETROLEUM CO.

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Dallas, Tex.	15.0	17.0	5.0	7.0
Fort Worth	15.0	17.0	5.0	7.0
Houston	16.0	18.0	5.0	8.0
San Antonio	16.0	18.0	5.0	8.0
El Paso	17.0	19.0	5.0	10.0
Muskogee, Ok.	16.0	18.0	5.0	8.0
Okla. City	16.0	18.0	5.0	8.0
Tulsa	16.0	18.0	5.0	8.0
Ft. Smith, Ark.	14.5	18.0	5.0	8.0
Little Rock	17.0	20.5	7.5	9.5
Texarkana	15.5	17.5	5.0	8.0

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Atl'tic City, N. J.	13.5	17.0	4.0	9.0
Newark	13.5	17.0	4.0	7.5
Annapolis, Md.	14.8	18.3	5.0	10.0
Baltimore	14.3	17.8	5.0	7.5
Cumberland	15.8	19.3	5.0	12.7
Wash'g'n, D. C.	12.5	16 0	3.0	9.0
Danville, Va.	14.6	20.1	6.0	12.9
Norfolk	15.1	18.6	6.0	11.3
Petersburg	15.8	19.3	6.0	11.7
Richmond	15.8	19.3	6.0	11.7
Roanoke	16.8	20.3	6.0	12.9
Charles'n, W. Va.	15.0	18.5	5.0	12.6
Parkersburg	14.3	17.8	5.0	11.2
Wheeling	15.5	19.0	5.0	12.2
Charlotte, N. C.	17.9	21.4	7.0	12.9
Hickory	18.2	21.7	7.0	13.1
Mt. Airy	18.2	21.7	7.0	13.2
Raleigh	17.6	21.1	7.0	12.7
Salisbury	18.0	21.5	7.0	13.0
Charleston, S. C.	16.2	19.7	7.0	11.3
Columbia	17.5	21.0	7.0	12.6
Spartanburg	17.9	21.4	7.0	12.9

Tank wagon gasoline refers to dealer instead of retail prices.

Price basis to dealers: Undivided dealers at regular price less one-half cent. Discount for kerosene, 1 cent off tank wagon price for 25 gallons or more under contract (contract not necessary in Baltimore) except in New Jersey, where no discount (if necessary) is given.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Omaha	16.9	18.9	5.0	10.1
McCook	17.6	19.6	5.0	10.8
Norfolk	17.3	19.3	5.0	10.5
North Platte	17.7	19.7	5.0	10.9
Scottsbluff	18.4	20.4	5.0	11.6

Note: Discounts to dealers; where service station gasoline prices are (maximum overall, including rent) as follows: Reliance, 2½ cents; Standard Red Crown, 2½ cents; Red Crown Ethyl, 3½ cents.

Where service station gasoline prices are below normal resellers' allowances are reduced one-half of the amount below normal, down to the following (minimum overall, including rent): Reliance, 2 cents; Standard Red Crown, 3 cents; Red Crown Ethyl, 3 cents. Discounts to consumers for tank wagon deliveries covered only by Standard Commercial Consumers Contract, effective January 1, 1935.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Ohio points	17.0	19.0	5.0	*12.5

*Includes state tax of 1 cent.

Pennsylvania, Delaware and Part of New England

ATLANTIC REFINING CO.

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Philadelphia, Pa.	16.0	18.0	5.0	9.0
Pittsburgh	17.0	19.0	5.0	10.0
Allentown	16.5	18.5	5.0	9 0
Erie	16.0	18.0	5.0	8 0
Scranton	16.5	18 5	5.0	10.0
Altoona	17.0	19.0	5.0	10.0
Dover, Del.	16 5	18 5	5.0	10.0
Wilmington	16.0	18.0	5.0	9.0
Springf'd, Mass.	13.2	16.7	4.0	7.5
Worcester	13.3	15.5	4.0	7.5
Hartford, Conn.	12.3	15.8	3.0	7.0
New Haven	12.2	15.7	3.0	7.5
Providence, R. I.	13.0	13.5	3.0	7.0

Note—Tank wagon prices are those applicable to consumers purchasing lots of 100 or more gallons in one delivery.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
N. Orleans, La.	17.5	21.0	‡8.0	12.0
Baton Rouge	16.5	20.0	†7.0	11.5
Alexandria	17.5	21.0	†*8.0	10.5
Lafayette	18.0	21.5	‡*8.0	12.5
Lake Charles	18.0	21.5	†*8.0	†11.0
Shreveport	16.0	19.5	†7.0	9.0
Knoxville, Tenn.	20.0	23.5	8.0	14.0
Memphis	18.0	21.5	8.0	9.5
Chattanooga	19.5	23.0	8.0	11.5
Nashville	19.0	22.5	8.0	10.0
Bristol	17.85	20.6	8.0	14.5

*Includes city tax of 1 cent.

†Includes 1-cent parish tax. ‡Includes 2 cent parish tax.

Tank wagon gasoline refers to dealer instead of retail prices.

Price basis to dealers: Undivided dealers at dealer price less one-half cent.

Louisiana kerosene prices include 1-cent state tax.

New York and New England

SOCONY-VACUUM CO., INC.

	Gasoline: Post deal	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Albany, N. Y.	14 2	17.7	5.0	7.5
*Met. New York	15.05	19.3	5.0	7.0
*Br'kl'n, Queens	14.5	18.8	5.0	7.0
Buffalo	12.0	14.0	5.0	8.0
Rochester	14.0	17.0	5.0	8.0
Syracuse	12.5	16.0	5.0	8.5
Boston, Mass.	13.0	16.5	4.0	6.75
Portland, Me.	12.5	16.0	5.0	7.5
Manch'ter, N. H.	14.8	18.3	5.0	7.75
Burlington, Vt.	16.2	19.7	5.0	8.5

*Does not include 2 per cent city sales tax which is calculated on basis of net retail price exclusive of state and federal taxes.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
San Francisco	13.5	15.5	4.0	10 0
Los Angeles	13.0	15.0	4.0	10 5
Fresno, Calif.	14 0	16.0	4.0	9.0
Phoenix, Ariz.	17.5	19.5	6.0	‡16.0
Reno, Nev.	16.5	18.5	5.0	13.0
Portland, Ore.	16.5	18.5	6.0	13.5
Seattle, Wash.	16.5	18.5	6.0	13.5
Tacoma	16.5	18.5	6.0	13.5
Spokane	19.5	21.5	6.0	16.5

*Retail prices posted by Standard Stations, Inc., a subsidiary.

†Prices are at company's plant or depots, as company does not operate stations. A 4-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where discount is 1 cent.

‡Includes 5-cent state tax.

Canada*

Imperial 3-Star Gasoline

IMPERIAL OIL, LTD.

	Gasoline: Tank wag.	Gasoline: Serv. sta.	Gasoline: Inc. tax	Kero. tank wag.
Hamilton, Ont.	21.0	23.5	6.0	16.5
Toronto, Ont.	21.0	23.5	6.0	16.5
Brandon, Man.	30.3	32.3	7.0	21.5
Winnipeg, Man.	28.7	31.7	7.0	20.3
Regina, Sask.	30.0	32.0	7.0	21.5
Saskatoon, Sask.	32.8	35.8	7.0	24.5
Edmonton, Alta.	32.2	35.2	7.0	23.7
Calgary, Alta.	29.5	32.5	7.0	21.0
Vancouver, B. C.	24.5	27.5	7.0	24.0
Montreal, Que.	20.5	23.0	6.0	17.0
St. John, N. B.	26.0	30.0	8.0	19.5
Halifax, N. S.	26.0	30.0	8.0	19.5

*Imperial gallon used in Canada.

In maritime provinces all dealers get 4 cents off service station price. In all other provinces open dealers get 3 cents off service station price and 1 cent additional to 100 per cent accounts, except Montreal City, Hamilton and Toronto, where open dealers get 2½ cents off service station price with 1 cent additional to 100 per cent accounts.

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	15.7
V.M.&P. naphtha	16.0
Cleaners' naphtha	15.0
Stanisol	15.0

*Prices include 3-cent Illinois tax, but not 1-cent federal tax or 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gallon lots if covered by contract.

Chicago Markets

CHICAGO, Nov. 4.—Notwithstanding lateness of the season, strength in refinery gasoline prices is the feature of the petroleum markets in this region. October proved to be a month of big consumption and jobber orders on contract have been coming through briskly. At the same time spot buying has been fair. Prices seem to have had no difficulty in holding their own.

Improvement in the California situation has been followed here by better feeling, as some had feared a breakdown of interior markets. There has been no betterment, however, in the central states' tank wagon and service station markets, which are still ragged, especially in the metropolitan sections. Subnormal prices and "under-canopy" concessions are features in most of the larger cities. Some stabilization work is continuing, however.

From the northern areas come inquiries from jobbers for better grades of gasoline. Indications are that the average motor fuel sold throughout this whole central area has been stepped up for winter performance. Kerosene is firmer. Good heating oils are attracting attention. U.G.I. gas oil is in good demand but the low-grade fuels are sloppy. A good tone continues in lubricants and wax has been doing better. Naphthas and solvents are dull, but firm. Petroleum coke is strong.

Retail Price Changes

Standard Oil Co. of New Jersey October 29 advanced tank wagon and station gasoline .2 cent in Washington.

Standard Oil Co. of California October 30 advanced tank wagon and station gasoline 1 cent in San Francisco and Fresno, 3.5 cents in Los Angeles and 2.5 cents in Phoenix.

PRICES ON REFINED PRODUCTS

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of November 5, 1935

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
Below 63 octane	.04¾	.04⅞
63-70 octane	.05⅝	.05⅝
60-62 400 grade:		
Below 63 octane	.04¾	.04⅞
63-70 octane	.05⅝	.05⅝
64-66 375	.04⅞	.05
68-70 360	.05	.05⅛

NORTH TEXAS—

U. S. Motor grades:		
Below 63 octane	.04¾	.04⅞
63-70 octane	.05⅝	.05⅝
60-62 400	.04¾	.04⅞
64-66 375	.04⅞	.05

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

U. S. Motor grades:	
Below 63 octane	.05½
63-70 octane	.06⅛
60-62 400	.05½

ARKANSAS (Ark., N. La., Miss. del.)—

U. S. Motor grades:	
Below 63 octane	.05½
63-70 octane	.06⅛

CHICAGO (based on Group 3)—

U. S. Motor grades:		
Below 63 octane	.04¾	.04⅞
63-70 octane	.05⅝	.05⅝
60-62 400	.04¾	.05
64-66 375	.04⅞	.05
68-70 360	.05	.05⅛
Aviation fighting grade	.05⅝	.06

PENNSYLVANIA (inland refineries)—

58-60 U. S. Motor:	
Below 60 octane	.05⅛
60-64.9 octane	.06⅝
65-70 octane	.06⅞
64-66 375	.05⅝
68-70 350	.05⅝

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.04½	.05⅝
58-60 400	.05⅝	.06½

EAST COAST—

U. S. Motor, below 60 octane:		
*New York (Bayonne)	.05⅝	.06
Baltimore		.05⅝
U. S. Motor, 60-64.9 octane:		
*New York (Bayonne)		.06
Philadelphia		.06
Boston		.06
Baltimore		.06
Charleston, S. C.		.06
U. S. Motor, 65 and above:		
*New York (Bayonne)	.06¼	.06½
Philadelphia		.06¼
Boston		.06½
Baltimore		.06¼
Charleston, S. C.		.06¼

*All grades of gasoline one-fourth cent less for small barge shipments.

GULF COAST (domestic)—

U. S. Motor grades:		
Below 60 octane		.05
60-64.9 octane	.05¼	.05½
65 octane and higher		.05½

Naphtha

PENNSYLVANIA (inland refineries)—

50-52 450 (blending)	.05
52-54 450 (blending)	.05
54-56 450 (blending)	.05⅛

CHICAGO (based on Group 3)—

50-52 450 (blending)	.04¾	.05
Cleaners' naphtha, 56-58 gr., 200 i.b.p., 20 e.p.	.06⅜	.07
Lacquer diluent, 180 i.b.p., 250 e.p.	.07⅜	.08
Lacquer diluent, 140 i.b.p., 200 e.p.	.08⅜	.09
Rubber solvent, 68-70 gr., 100 i.b.p., 300 e.p.	.06⅜	.07
Stoddard solvent, 300 i.b.p., 410 e.p., over 83° flash	.06⅜	.06½
Pet. thinner, 200-300 i.b.p., 410 e.p., over 83° flash	.06⅜	.06½
V.M.&P. naphtha, 56-58 gr., 190-200 i.b.p., 320° e.p.	.06⅜	.07
Petroleum spirits	.05⅜	.06

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70	.03¾	.04
Grade 18-55	.04¾	.04⅞
Low vapor pressure grade:		
*14 lb. v.p. (max.)	.05⅛	.05⅝
*12 lb. v.p. (max.)	.05½	.05⅝

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

Grade 26-70	.04⅛

NORTH TEXAS—

Grade 26-70	.03½	.03⅝
Grade 18-55	.04⅝	.04⅝
*14 lb. v.p. (max.)	.04⅞	.05⅛
*12 lb. v.p. (max.)	.05⅛	.05½

CALIFORNIA—

75-85 275-390	.04½	.05½

*Nominal.

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43	.03⅝	.03½
42-44	.03½	.03⅝

NORTH TEXAS—

41-43	.03¼

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

41-43	.03⅝

ARKANSAS (Ark., N. La., Miss. del.)—

41-43	.04⅛

PENNSYLVANIA (inland refineries)—

45	.04⅝	.04⅝
46	.04⅝	.04⅝
47	.04⅞	.05

CHICAGO (based on Group 3)—

41-43	.03⅝	.03½
42-44	.03⅝	.03⅝

CALIFORNIA (Pac. Coast market)—

38-40 high burning test	.04¾	.05

NEW YORK (Bayonne, N. J.)—

*41-43		.05

GULF COAST (domestic)—

41-43	.04¼	.04½

*Barge price one-eighth cent lower.

Petroleum Coke

(Prices per ton f.o.b. Chicago area. Refineries absorb freight to 80 cents a ton.)

Pile run	6.25
Direct from still	7.25
Egg, nut, pea	8.00
Lump	8.75

Furnace Oil

OKLAHOMA (Group 3)—

No. 1 prime white, 38-42	.03¼	.03⅜
No. 1 straw, 38-40	.03	.03⅛
No. 2 straw, 32-36	.02⅞	.03⅛
No. 2 dark, 32-36	.02⅞	.03
No. 3, 28-32	.02⅝	.02⅞
No. 3, 15 and above, 28-32	.02½	.02⅝

NORTH TEXAS—

No. 1 prime white, 38-42	.03¼	.03⅜
No. 1 straw, 38-40	.03	.03⅛

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

No. 2, 32-36	.03¼	.03¼

ARKANSAS (Ark., N. La., Miss. del.)—

No. 2, 32-36	.03½
No. 3, 28-32	.03¼

CHICAGO (based on Group 3)—

No. 1 prime white, 38-40	.03⅛	.03¼
No. 1 straw, 38-40	.03	.03⅛
No. 2 straw, 32-36	.02⅞	.03
No. 2 dark, 32-36	.02⅝	.02⅞
No. 3, zero to 15, 28-32	.02⅝	.02⅞
No. 3, 15 and above, 28-32	.02¼	.02½

NEW YORK (Bayonne, N. J.)—

*No. 1	.04⅞	.05
*No. 2		.04
*No. 4		.03¾

*Barge deliveries one-eighth cent under above tank car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil	.02¼	.02⅝
No. 4, 24-28	.87½	.90
No. 4, 15 and above, 24-28	.75	.80
No. 5	.70	.75
No. 6	.67½	.70
Below 18 fuel oil, industrial	.65	.67½

NORTH TEXAS—

U.G.I. gas oil	.02⅝	.02½
No. 4, 24-28	.87½	.90
No. 5	.72½	.75
No. 6	.67½	.70
Below 18 fuel oil, industrial	.65	.67½

NORTH LOUISIANA (Ark., N. La. and Miss. delivery)—

U.G.I. gas oil	.02⅞	.03⅛
10-14 fuel oil, industrial	.75	.80

ARKANSAS (Ark., N. La., Miss. del.)—

10-14 fuel oil, industrial	.60	.65

CHICAGO (based on Group 3)—

U.G.I. gas oil	.02¼	.02⅝
No. 4, 24-28	.87½	.90
No. 4, 15 and above, 24-28	.72½	.77½
No. 5, 18-22	.62½	.65
No. 6, 10-16	.52½	.55

Fuel oils of more than 40 cold test generally 5 to 15 cents per bbl. in these areas.

PENNSYLVANIA (inland refineries)—

36-40	.04	.04⅛

CALIFORNIA—

Los Angeles:		
30-34 gas oil, per bbl.	1.05	1.25
27 plus Diesel	1.05	1.25
27 plus Diesel (bunkers)	1.25	1.30
12-16 (bunkers at tidewater)	.87	.95
10-16 (cargo lots)	.75	.92½
12-17 (tank cars)	.65	.95
San Joaquin Valley:		
10-18 (tank cars)	.60	.75
San Francisco:		
27 plus Diesel, per bbl.		1.25
27 plus Diesel (bunkers)		1.35
10-16 (bunkers)		1.00

GULF COAST—

28-30 gas oil		.03¼
28-30 Diesel (bunkers)		1.70
Bunker C (bulk cargoes)		.70
Bunker C (bunkers)		.80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.04
28-30 Diesel (lighterage 6⅛ plus per bbl.)		1.65
28-30 Diesel (tank cars)		.04
*Bunker C (to ocean-going ships in N. Y. harbor)		.95
Industrial fuel (tank cars)		.03⅝

*Lighterage charge 5c bbl. additional.

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.P.A.)

OKLAHOMA (Group 3)—

Zero to 10 Cold Test:	
150-3	.10
180-3	.11¼
180-4	.10⅝
200-3	.11⅝
200-4	.11¼
240-3	.13⅝
240-4	.13¼
280-3	.14⅝
280-4	.14
300-3½	.15¼
400-3½	.16
100-3 paraffin oil	.05⅝
15-20 Cold Test:	
200-3	.10⅝
200-4	.10¼
240-3	.12⅝
240-4	.12¼
280-3	.13⅝
280-4	.13

GULF COAST—

Pale Oils:		
200-3	.07	.07½
300-3	.07½	.08
500-3½	.08½	.09
750-3½	.09	.09¼
1,200-3½	.09½	.09⅝
2,000-4	.09⅝	.10
Red Oils:		
200-5-6	.07	.07¼
300-5-6	.07¼	.07½
500-5-6	.08	.08½
750	.08½	.09
1,200-5-6	.09¼	.09½

CALIFORNIA (moving to dom. market)

Pale Oils:		
100-2½-3	.07	.07¼
200-2½-3	.07⅛	.07⅜
300-3-3½	.08	.08⅛
350-3-4	.09	.09⅛
400-3-4	.09⅛	.09⅜
450-3-4	.10	.10⅛
550-3-4	.10⅛	.10⅛
600-3-4	.10⅛	.10⅜
Red Oils:		
200-4-5	.07	.07⅛
300-5-6	.07⅛	.07⅜
350-5-6	.08⅛	.08⅜
400-5-6	.09	.09⅛
450-5-6	.09⅛	.09⅛
500-5-6	.09⅛	.09⅜
600-5-6½	.10	.10⅛
700-6½ plus	.10⅛	.10⅛
750-6½ plus	.10⅛	.10⅜
900-6½ plus	.10⅜	.11

PENNSYLVANIA—

150 vis. at 70° F., color, 400-405 flash:		
Zero pour test	.21	.21½
10 pour test	.20	.20½
15 pour test	.19½	.20
25 pour test	.18½	.19
180 vis. at 70° F., 3 color:		
25 pour test	.21	.21⅛
200 vis. at 70° F., 3 color:		
Zero pour test	.25½	.26
10 pour test	.24½	.25
15 pour test	.24	.24½
25 pour test	.23	.23⅝

Bright and Steam Refined

OKLAHOMA (Group 3)—

Bright Stocks:		
190-200 D, 15-25		.20
150-160 D, 0-10		.17
150-160 D, 15-25		.16⅛
150-160 E, 15-25		.16
100-110 D, 0-10		.15⅝
Steam refined:		
630 green (treated)		.09½
600 light green, untreated		.08½
600 dark green, untreated	.05	.06

PENNSYLVANIA—

Bright Stocks (Pennsylvania grade, No. 8 color, 145-50 at 510; 540-550 flash):		
10 pour test	.22	.22½
15 pour test	.21	.21½
20 pour test	.20	.20½
25 pour test	.19	.19½
Steam refined:		
600	.09½	.10
650	.11	.11½
600 Pennsylvania flash	.12	.12½
630 flash	.17	.17½
600 Warren E filtered	.13	.13½

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (a.m.p.) w.c. scale	.02¼	.02⅜

PENNSYLVANIA (inland refineries)—

122-124 (a.m.p.) w.c. scale	.0225	.0230
124-126 (a.m.p.) w.c. scale	.0225	.0230

NEW YORK—

Wax in bags fully refined:		
123-125 (a.m.p.) wax		.0420
125-127 (a.m.p.) wax		.0430
128-130 (a.m.p.) wax		.0455
130-132 (a.m.p.) wax		.0480
133-135 (a.m.p.) wax		.0510
135-137 (a.m.p.) wax		.0565
124-126 (a.m.p.) w.s.		.0225
124-126 (a.m.p.) y.s.	.0220	.0225
Petrolatum in barrels, carload lots:		
Dark green		.01⅞
Amber	.02⅞	.03
Extra amber	.03	.03⅛
Lily white	.06⅝	.06⅞
Snow white	.07⅜	.07⅝
Cream	.05⅝	.05⅞

CHICAGO (f.o.b. switching district; carload lots in bags, add 3° for a.m.p.)

122-124 (a.s.t.m.) wax	.0440	.0450
125-127 (a.s.t.m.) wax	.0465	.0475
127-129 (a.s.t.m.) wax	.0480	.0490
*130-132 (a.s.t.m.) wax	.0520	.0530
*132-134 (a.s.t.m) wax	.0545	.0555

*For wax shipped in bulk or bag.

Export Prices

GASOLINE

GULF COAST—

U. S. Motor		.05⅛
60-62 400	.05⅛	.05¼
61-63 390		.05¼
64-66 375	.05⅝	.05⅛

LOS ANGELES—

U. S. Motor grades:		
53-55 octane		.04
55-65 octane	.04	.04¼
65-67 octane	.04¼	.04⅛
67-69 octane	.04⅛	.04⅜
Above 69 octane	.04⅜	.05
58-60 400 endpoint	.04⅛	.05

KEROSENE

GULF COAST—

41-43 prime white		.03⅜
41-43 water white	.03⅜	.04
44 water white		.04⅛

LOS ANGELES—

41-43 water white	.04¼	.04⅜

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbls.)—

Cylinder Stocks:		
600 Warren E	.19½	.20
600 S.R. unfiltered		.16½
650 S.R. unfiltered	.17½	.18
600 flash S.R.	.18½	.19
630 flash S.R.	.23	.24
Bright Stocks:		
8 color		.26
6½ plus colors in dilution		.25½

NEUTRAL OIL

200-3 color		.29½
150-3 color		.25

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 a.m.p.		.025
125-127 a.m.p.		.03625
128-130 a.m.p.		.03875
130-132 a.m.p.		.04125
133-135 a.m.p.		.04625
135-137 a.m.p.		.04875
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124-126 w.s.	.0220	.0225
124-126 y.s.		.0220

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